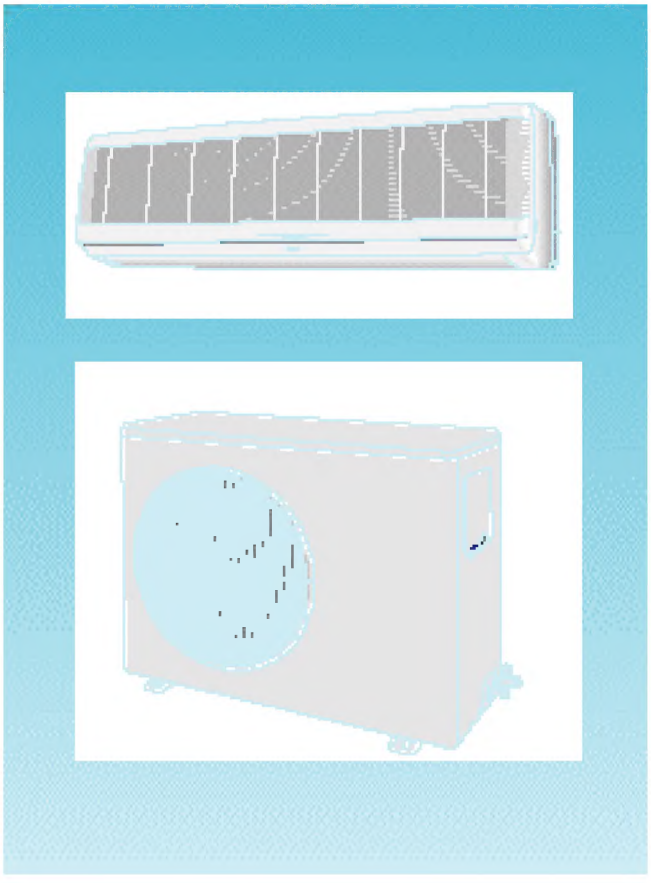
ROOM AIR CONDITIONER

ASH180UE/ASH181UE
ASH-2417ER
ASH-1808DR

SERVICE Manual

AIR CONDITIONER



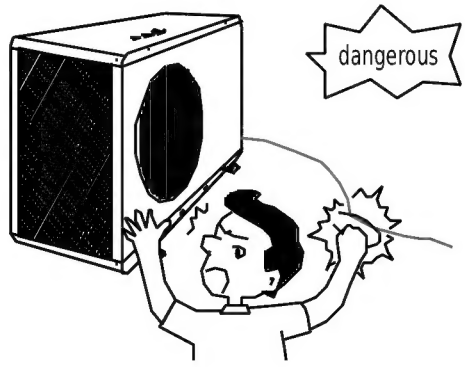
CONTENTS

1. Precautions
2. Product Specifications
3. Operating Instructions and Installation
4. Disassembly and Reassembly
5. Troubleshooting
6. Exploded Views and Parts List
7. Block Diagrams
8. PCB Diagrams
9. Wiring Diagrams
10. Schematic Diagrams

© Samsung Electronics Co., Ltd. APR. 1998.
Printed in Korea.
Code No. DB81-10154A

1. Precautions

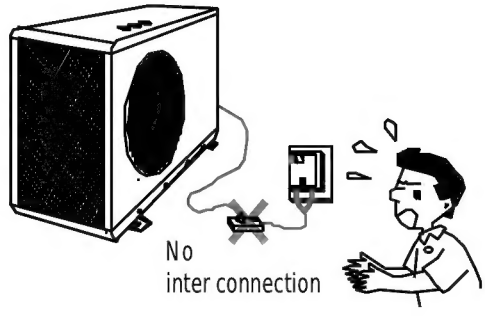
1) Remove power cable from power outlet.
Remove power cable from an outlet prior to disassembly for repair.
When the power cable is removed wait for at least 1 minute and measure the voltage between the + and - terminal of the large capacity electrolyti capacitor using a tester. Make sure that the voltage is less than DC 10V, then starts repairing.



2) Warning about electrical shock
If you cannot avoid checking the circuits with power not disconnected pay special attention not to touch live parts to avoid electric shock.

3) Use proper parts
Use genuine parts of a model if parts need to be replaced. (It is recommended that parts are replaced rather than repaired, to avoid electrical contact. Customers should refrain from repairing parts themselves as this can be extremely dangerous.)

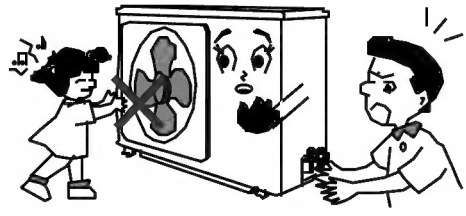
4) Use proper tools
Use proper tools for repair and be familiarized with handling test equipment.
Using worn out tools may result in problems such as intermittent contact, etc



5) Lead wire or power cable damaged
Check if lead wire or power cord is damaged prior to repair, and replace if damaged.

6) Avoid tapping a power cord
Tapping a power cable or using an extension cord from a power outlet is dangerous and should be avoided. It may result is malfunctioning or fire.

7) Checking insulation
Be sure to check insulation resistance when assembly is completed. (Check insulation resistance between the power cord plug and ground terminal using an ohm meter and check if it is greater than 30MΩ prior to applying the power.)



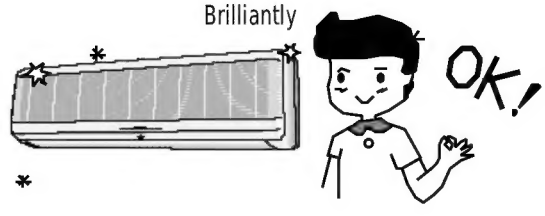
8) Check grounding
Check grounding status and fix it if not sufficient.

9) Check installation condition
Check installation condition and fix insufficient conditions.
If it is still not satisfactory find another area for installation.

10) Child care
It is recommended to have children stay away the units when the repair is being done to avoid accidents.

Cleaning

Clean the unit and the area arount it.
Let the customer know that the unit has been repaired.



MEMO

2. Product Specifications

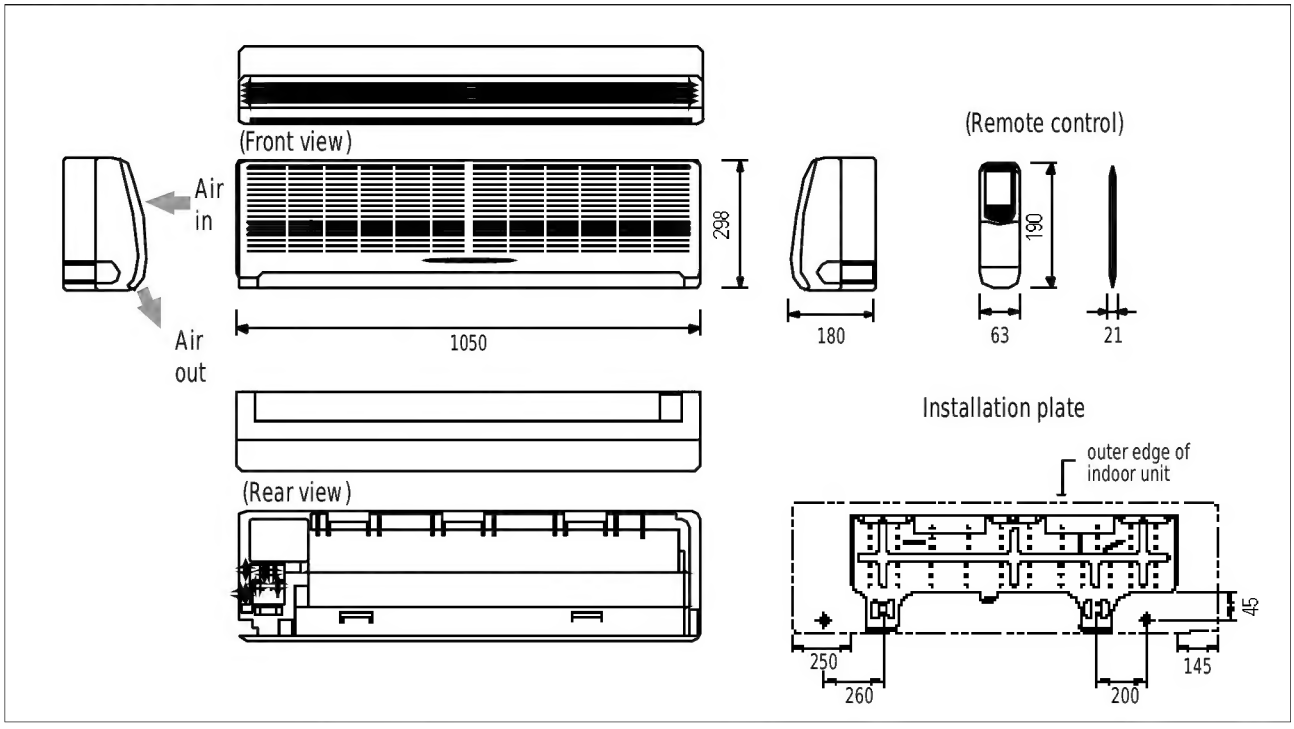
2-1 Table

Item				Model	ASH180UE/181UE		ASH-2417ER		ASH-1808DR	
					Indoor unit	Outdoor unit	Indoor unit	Outdoor unit	Indoor unit	Outdoor unit
Performance	Type			-	Wall-mounting		Wall-mounting		Wall-mounting	
	Cooling			BTU/h	17,500		21,500		18,000	
	Dehumiditying				3.4		5.9		3.4	
	Heating			BTU/h	19,000		22,000		18,000	
	Low temp. heating			BTU/h	-		-		-	
	Air volume		Cooling	m^3/min.	13.8		13.1		12.5	
			Heating	m^3/min.	14.1		13.6		13.0	
	Noise		Cooling	dB	44	55	46	57	45	57
			Heating	dB	44	55	46	57	45	57
	Energy efficiency ratio		Cooling	BTU/h.W	9.7		8.4		9.0	
			Heating	BTU/h.W	9.5		8.8		9.5	
Power Electrical Characteristics	Power			ø-V-Hz	1-220/240-50		1-220/240-50		1-200/220-50	
	Power consumption		Cooling	W	1,800		2,500		2,000	
			Heating	W	2,000		2,500		1,900	
	Operating current		Cooling	A	8.0		12.0		9.5	
			Heating	A	9.0		12.0		9.0	
	Power factor		Cooling	%	93.8(at240V)		86.8(at240V)		95.7(at220V)	
			Heating	%	92.6(at240V)		86.8(at240V)		96.0(at220V)	
	Starting current			A	40		72		62	
	Power cable		Length	m	6.2		6.2		6.2	
			Number of core wire		3Gx2.5mm^2/Area		3Gx2.5mm^2/Area		3Gx2.5mm^2/Area	
	Fuse capacity			A	3.15	-	3.15	-	3.15	-
Product	Outer dimension	Width x Height x Depth		mm	1,050x298x180	787x620x320	1,050x298x180	787x620x320	1,050x298x180	787x620x320
				inch	41.34x11.73x7.09	30.98x24.4x12.6	41.34x11.73x7.09	30.98x24.4x12.6	41.34x11.73x7.09	30.98x24.4x12.6
		Weight		kg	13	46	13	59	13	59
	Coolant pipe		Liquid	OD(mm)	ø6.35x5		ø6.35x5		ø6.35x5	
			Coolant	x L(m)	ø12.7x5		ø15.88x5		ø12.7x5	
	Drain hose			ID(mm) x L(mm)	ø17x2000		ø17x2000		ø17x2000	
	Compressor	Type			-	Rotary	-	Reciprocating	-	Reciprocating
		Motor	Type		-	-	-	P.S.C	-	P.S.C
			Rated input	W	-	-	-	2,620	2,170	
	Blower	Type			Cross-fan	Propeller	Cross-fan	Propeller	Cross-fan	Propeller
		Motor	Type		Resin	Steel	Resin	Steel	Resin	Steel
			Rated input	W	30	60	30	60	30	60
Heat exchanger					2Row 12Step	2Row 24Step	2Row 12Step	2Row 24Step	2Row 12Step	2Row 24Step
Coolant control unit					-	Capillary-tube	-	Capillary-tube	-	Capillary-tube
Freezer oil capacity				cc	-	410	-	1,180	-	1,180
Coolant to charge(R-22)				g	1,300		1,750		1,670	
Cooling test condition					INDOOR UNIT : DB 27˚C WB 19˚C OUTDOOR UNIT : DB 35˚C WB 24˚C				27˚C ,19.5˚C 35˚C,24˚C	
Heating test condition					INDOOR UNIT : DB 20˚C OUTDOOR UNIT : DB 7˚C WB 6˚C					
Maximum operation condition					INDOOR UNIT : DB 32˚C,WB 23˚C OUTDOOR UNIT : DB 43˚C,WB 26˚C		29˚C, 19˚C 54˚C, 24˚C		32˚C, 22.5˚C 43˚C, 25.5˚C	

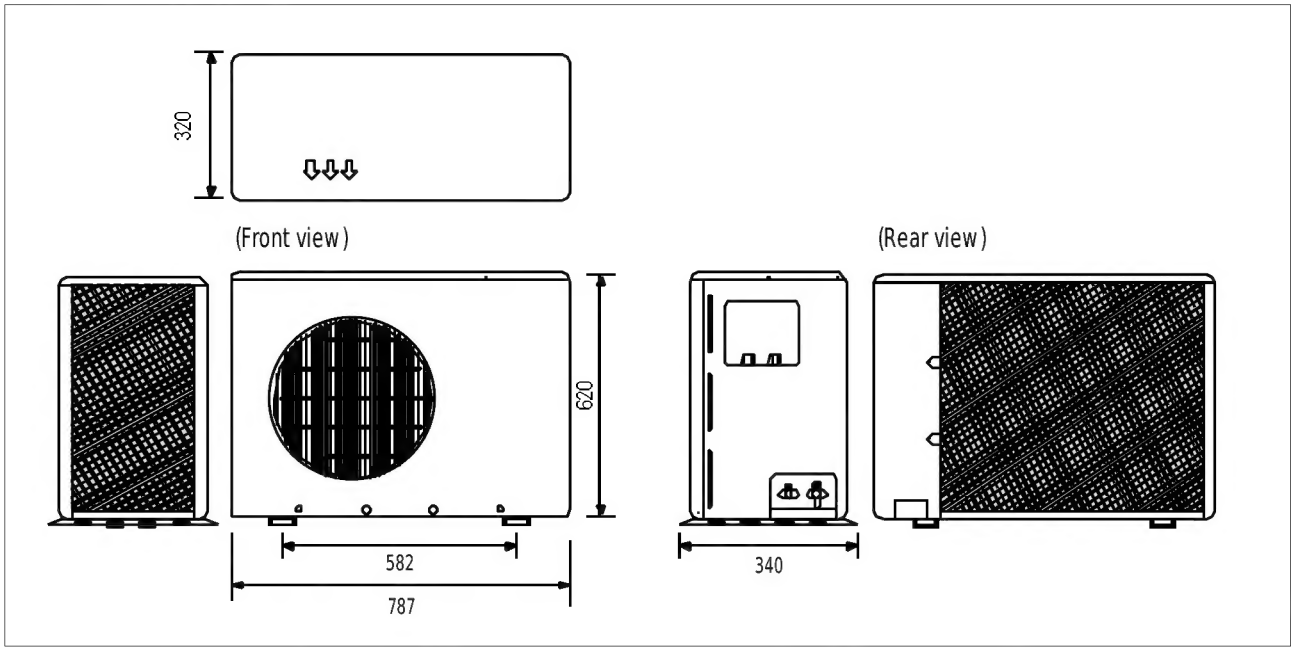
2-2 Dimensions

2-2-1 Indoor Unit

unit : mm



2-2-2 Outdoor Unit



3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Name & Function of Key in remote controller

NO	NAMED OF KEY		FUNCTION OF KEY	
1	ON/OFF		▷ Use this button to start and stop air conditioner.	ONE SHOT KEY
2	MODE		▷ Each time you press this button, MODE is changed in the following order. "AUTO" → "COOL" → "DRY" → "FAN" → "HEAT"	ONE SHOT KEY OR CONTINUOUS KEY
3	TURBO		▷ Use this button to provide heavy duty cooling (heating) for 30 minutes.	ONE SHOT KEY
4	MILD		▷ Use this button to provide pleasant cooling (heating) for 3 hours.	ONE SHOT KEY
5	Q. TIMER		▷ Set up the reserve or cancel the timer on and timer off quickly.	ONE SHOT KEY OR CONTINUOUS KEY
6	FAN SPEED		▷ Each time you press this button, FAN SPEED is changed in the following order. "AUTO" → " ▮▮(L)" → " ▮▮▮(ME)" → " ▮▮▮▮(HI)" → NATURAL	ONE SHOT KEY OR CONTINUOUS KEY
7	SWING	SET	▷ Adjusts air flow vertically. Each time you press this button, BLADE-H rotates by 8° (Changable range 50°).	ONE SHOT KEY OR CONTINUOUS KEY
		AUTO	▷ Each time you press this button, BLADE-H rotates within 35° and stop.	ONE SHOT KEY
8	TIME		▷ Without regard to ON/OFF condition in remote controller, use this button to set current time. Adjust the current time using ▲TIME ▼ button. (Data can be transmitted after setting up the time)	ONE SHOT KEY
9	TIMER/CANCEL		▷ Use this button to reserve or cancel the timer on and timer off.	ONE SHOT KEY
10	TIMER	ON	▷ Set up the time that operation start.	ONE SHOT KEY
		OFF	▷ Set up the time that operation stop.	
11	TIME	▲ (UP)	▷ If the ▲TIME button is pressed once, the time increase by one minute during the time set mode, and ten minutes during the timer set mode.	ONE SHOT KEY OR CONTINUOUS KEY
		▼ (DOWN)	▷ If the TIME ▼ button is pressed once, the time decrease by one minute during the time set mode, and ten minutes during the timer set mode.	ONE SHOT KEY OR CONTINUOUS KEY
12	TEMP	▲ (UP)	▷ If the ▲ button is pressed once, the setting temperature is increased by 1°C.	ONE SHOT KEY OR CONTINUOUS KEY
		▼ (DOWN)	▷ If the ▼ button is pressed once, the setting temperature is decreased by 1°C.	
13	SLEEP		▷ Use this button for sleep operation. (The SLEEP mode can be selected at COOL and HEAT mode.)	ONE SHOT KEY

3-1-2 Main controller function.

1. AUTO MODE: In this mode, operation mode (COOL, HEAT) is selected automatically by the room temperature of initial operation.

Room Temp	Operation Type
Tr≥21°C+ΔT	Cool Operation (Set Temp:24°C+ΔT)
21°C +ΔT>Tr	Heat Operation (Set Temp : 22°C+ΔT)

   ΔT= -1°, -2°C, 0°C, +1°C, +2°C
   ΔT is controlled by setting temperature up/down key of remote controller

2. COOL MODE: The unit operates according to the difference between the setting and room temperature.
   The setting temperature range is 18°Cthrough 30°C.

3. HEAT MODE: The unit operates according to the difference between the setting and room temperature.
   The setting temperature range is 16°C through 30°C.
   *Prevention against cold wind : For about 3~5 minutes after initial operation, thermo control or °∞de-ice°±, the indoor fan will either not operate or operate very slowly (650 rpm), then switch to the selected fan speed. This period is to allow the indoor unit's heat-exchanger to prewarm before emitting warm air.
   *Protective function : High temperature release.
   *De-ice: Deicing operation is controlled by indoor unit's heat exchanger temperature and room temperature and accumulating time of compressor's operation.

4. DRY MODE: The unit is operated at compressor on state regardless of room temperature for an initial 30 minutes of dehumidification operation, and the indoor fan motor is automatically operated due to the temperature difference between the room temperature and set temperature.
   The compressor is automatically controlled due to the temperature difference between room temperature and set temperature after operation of 30 minutes.
   *Set Temperature : 23°C
   *Protective function: Low temperature release. (Prevention against freeze)

5. TURBO MODE: This mode is available only in AUTO, COOL, HEAT mode.
   When this button is pressed at first, the air conditioner is operated "powerful" state for 30 minutes regardless of the set temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.

6. MILD MODE: This mode is available only in AUTO, COOL, HEAT mode.
   When this button is pressed at first, the air conditioner is operated in its current state for 3 hours.
   When this button is pressed again or when the operating time is 3 hours, mild operation mode is canceled and returned to the previous mode.

7. SLEEP MODE: Sleep mode is available only in COOL or HEAT mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.
   *In HEAT mode : The setting temperature is automatically droped by 1°C each 1hour. When the temperature has been droped by total of 2°C, that temperature is maintained.

8. DE-ICE Operation: De-ice operation is controlled by sensing the indoor unit's heat-exchanger temperature and timer.
   De-ice ends by sensing of the processing time by de-ice condition.

9. FAN SPEED: Manual (3 step), Auto (4 step), Natural
   Fan speed automatically varies depending on both the difference between setting and the room temperature.

10. COMPULSORY OPERATION:
    For operating the air conditioner without the remote controller.
    The operating is the same function that AUTO MODE in the remote controller.

11. SWING: BLADE-H is rotated vertically by the stepping motor.
    *Memory louve: When ON/OFF button is pressed at stop state, the BLADE-H returns to its original location which is operating state before stop
    *Swing auto: The BLADE-H can rotate within about 35° in the original position set by the SWING SET button.
    *Swing set: Press the SWING SET button, then the blade rotates vertically by 8°
    The BLADE-H location is dispalyed on REMOTE CONTROL. (total 7 steps)

12. Q.TIMER: Q. timer (quick timer) allows reservation or cancel the timer on and timer off quickly
    When Q.timer button is pressed at operating state, LCD displays the polling state sequentially.
    The LCD also displays the time remaining.

13. TIMER: The air conditioner is turned ON/OFF at a specified time using TIMER ON/OFF.
    * Timer LED lights on.

14. SELF TEST
    *Interruption of electric power and Power on.
    *Abnormal condition of the room sensor.
    *Indoor unit fan motor lock.
    *Abnormal condition of the indoor unit's heat exchanger sensor.

15. TIME SHORTENING: If the "Time short" connector pin is shorted on the main P. C. B, the compressor's three minutes delay function is cancelled, and each operation time is shortened to one fiftieth of its original time.

16. BUZZER SOUND: Whenever the ON/OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep"

3-2 Installation

3-2-1 Selecting Area for Installation

Select an area for installation that is suitable to the customer's needs.

3-2-1(a) Indoor Unit

1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.

3-2-1(b) Outdoor Unit

1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light.
   (Install a separate sunblind if exposed to direct sun light.)
2. Make sure that you install the outdoor unit in area allowing good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours.
   (Fix the unit firmly if it is mounted in a high place.)
3. Make sure that you install the outdoor unit in area providing good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
4. Make sure that you install the outdoor unit in area free from animals or plants.
5. Make sure that you install the outdoor unit in area not blocking the traffic.
6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe (10 meters).
   Note
   1. Add "A" grams of refrigerant (R-22) for every 1 meter if the pipe length exceeds the standard pipe length of 5 meters.

MODEL	"A"
ASH180UE ASH181UE	10g
ASH2417ER ASH1808DR	40g

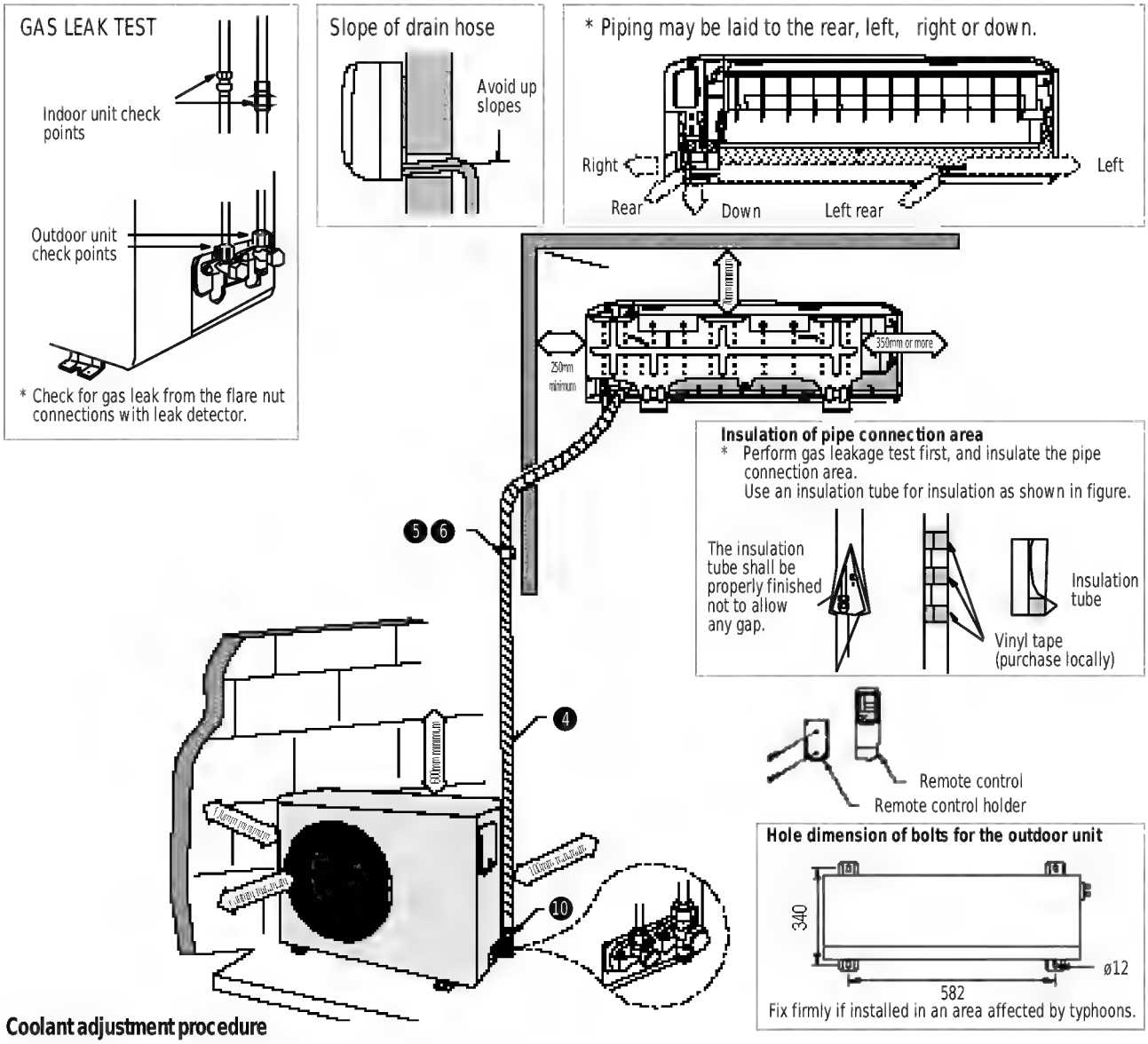
   2. Maintain a height between the indoor and outdoor units of less than 3 meters.
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

3-2-1(c) Remote Control Unit

1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at

Caution :
It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.

3-2-2 Installation diagram of indoor unit and outdoor unit


GAS LEAK TEST
Indoor unit check points
Outdoor unit check points
* Check for gas leak from the flare nut connections with leak detector.
Slope of drain hose
Avoid up slopes
* Piping may be laid to the rear, left, right or down.
Right
Left
Rear
Down
Left rear
350mm or more
250mm minimum
Insulation of pipe connection area
* Perform gas leakage test first, and insulate the pipe connection area.
Use an insulation tube for insulation as shown in figure.
The insulation tube shall be properly finished not to allow any gap.
Insulation tube
Vinyl tape (purchase locally)
Remote control
Remote control holder
Hole dimension of bolts for the outdoor unit
340
ø12
582
Fix firmly if installed in an area affected by typhoons.

Coolant adjustment procedure

Class	At installation		At installation	
Connection pipe lengh	Air-purge method	Coolant adjustment	Air purge method	Refrigerant quantity
5m max	Refer to the detailed air-purge procedure.	unnecessary	Purge air using a vacuum pump or an additional coolant cylinder.	See table right.
5~10m		Add "A"g of coolant <R-22>for every 1m. (Refer to the detailed coolant charge procedure.)		Add "A"g of coolant <R-22>for every 1m. (Refer to the detailed coolant charge procedure.)

Coolant adjustment procedure

Outer diameter	Fixing torque	Final torque
ø6.35mm	160kg · cm	200kg · cm
ø12.7mm	500kg · cm	550kg · cm
ø15.8mm	700kg · cm	750kg · cm

Tighten the flare nut by hand first, and tighten firmly with a spanner

Coolant-quantity

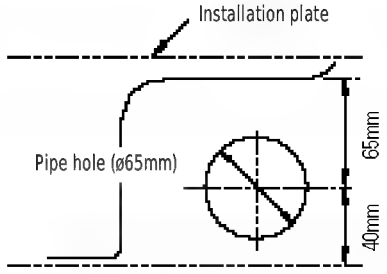
Model	Coolant quantity	Remark
ASH180UE ASH181UE	1300g	Self refrigerant is included with shipment.
ASH-2417ER	1750g	Self refrigerant is included with shipment.
ASH-1808DR	1670g	Self refrigerant is included with shipment.

For more information refer to the Installation Manual.

3-2-2(a) Fixing the Installation Plate

CUTTING A HOLE

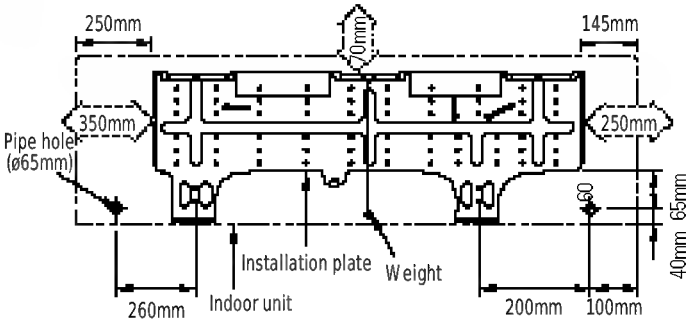
When the refrigerant piping are hooked up from the rear.



▶ Determine the pipe hole position using the paper pattern for installation and drill the pipe hole (65mm inner diameter) so that it slants slightly downward.

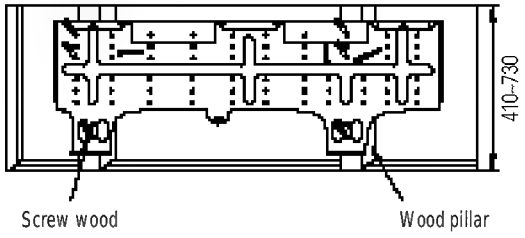
MOUNTING THE INSTALLATION PLATE

When the installation plate is directly mounted on the wall.



1. Install the installation plate horizontally on structural members (studs, etc.) in the wall.
2. To mount the installation plate on a concrete wall with anchor bolts, utilize the anchor bolt holes as illustrated in the left figure.
3. When the anchor bolts are already driven in the wall, also utilize the anchor bolts holes to secure the installation plate. (If an anchor bolt is too long, adjust the projecting length to 20mm or less.)

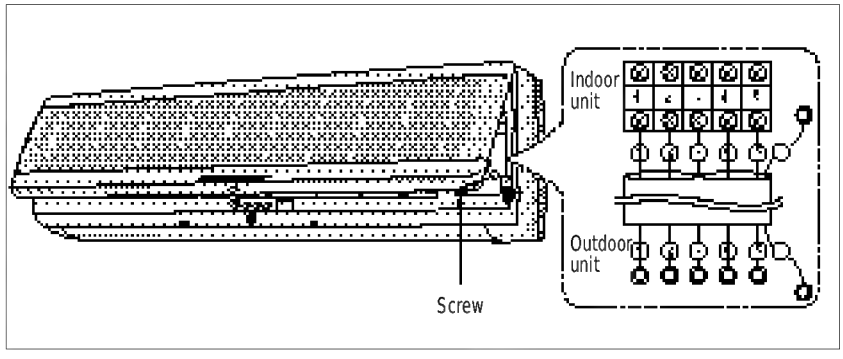
Mounting at the window frame.



1. When mounting installation plate at the window frame. Use the paper patten for installation of the wood pillar.
2. As the left Fig.
   Fix the wood pillar at the wood frame and install installation plate with screw tap.
3. Fix the wood pillar with enough strength to bear the weight of the indoor unit.

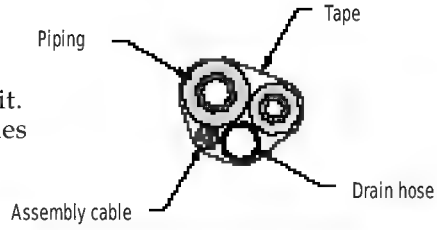
3-2-2(b) Purging the Unit

1. Open the Grille and remove the screw securing the cover.
2. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals 1~5.
   *Each wire is labelled with the corresponding terminal number.
3. Assembly every parts by contrary order to disassembly.



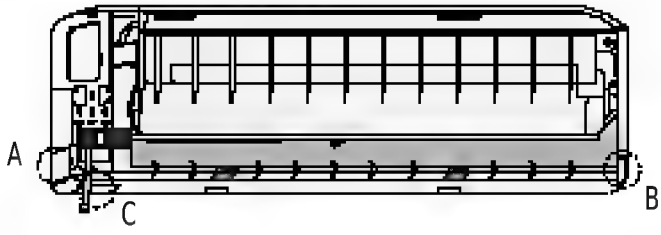
3-2-2(c) Piping and drain hose installation

1. Fix the drain hose right the refrigerant piping.
2. Be careful not to form a slack of the drain hose.
3. Do not allow the piping to jut out from the back of the indoor unit.
4. Insulate both of the refrigerant pipings so that dewing and troubles may not happen.
5. Be careful in bending the pipes. The bending radius must be 100mm or larger.



A.Right-hand connection with piping

1. Cut out the knock-out piece from the rightside of the rear body with a knife, etc. Smooth the cut edges.
2. Cut out the Holder-pipe slit part.
3. Support the above section to be bent with your hand and bend the pipes there.



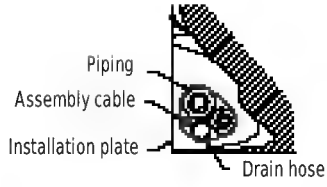
B.Left-hand connection with piping

1. Cut out the knock-out piece from the leftside of the rear body with a knife, etc. Smooth the cut edges.

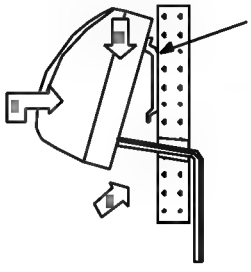
C.Under-side connection with piping

1. Cut out the knock-out piece from the underside of the rear body with a knife, etc. Smooth the cut edges.
2. Cut out the Holder-pipe on its slit part.

Set the drain hose in the inner part of the indoor unit and the assembly cable in lower part of it. Wind tape round them.



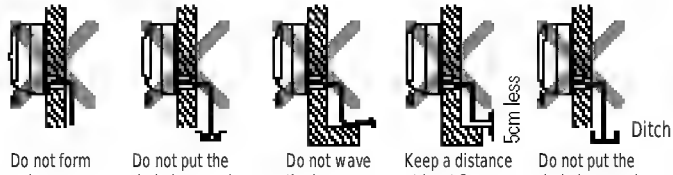
3-2-2(d) Indoor unit installation



1. Pass the pipes through the hole in the wall and hook the indoor unit to the installation plate at the upper and lower hooks.
2. Move the indoor unit to the right and left to make sure that the unit is securely hooked on to the installation plate.

DRAINAGE

1. Run the drain hose sloped downward.
2. Do not install the drain hose as illustrated below.



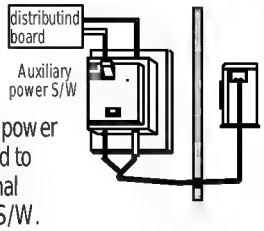
Do not form a rise | Do not put the drain hose end into water | Do not wave the hose | Keep a distance at least 5cm or more | Do not put the drain hose end in the ditch

3. Put water in the drain pan and make sure that the water is drained outdoor.
4. When connecting the extension drain hose, insulate the inside part of the extension drain hose with shield.

3-2-2(e) Indoor unit installation

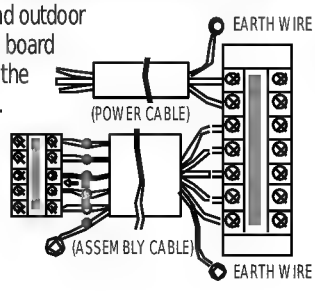
AUXILIARY POWER S/W

Auxiliary power S/W should be installed near indoor unit so that each access is possible.
Main/Outdoor unit power cords are connected to upper/lower terminal of auxiliary power S/W.



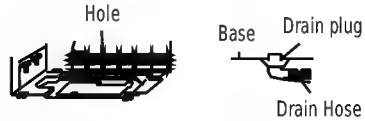
WIRING CONNECTION

Indoor unit connector wire should be connected to both indoor unit connector and outdoor unit terminal board as shown in the figure below.



INSTALLATION OF DRAIN LINE

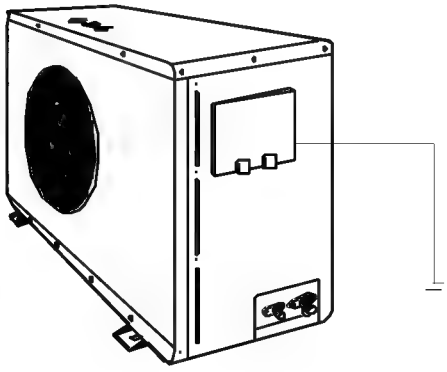
In heating and deice operation, condensed water may be generated.
Install drain line as following procedure.
1. Insert the drain plug into base hole
2. And then connect drain hose to drain plug.



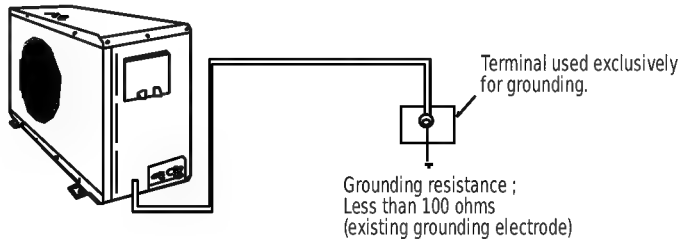
3-2-2(f) Grounding

(The Parts for this work are optional.)

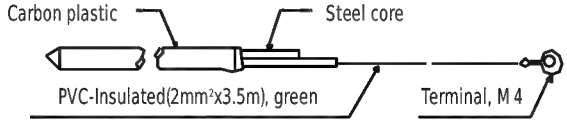
- A grounding terminal can be found on the outdoor unit as illustrated.



1. When an existing grounding terminal is avilable. (Grounding wire of ø1.6mm or larger<solid wire>or 2mm² or larger <standard wire>)



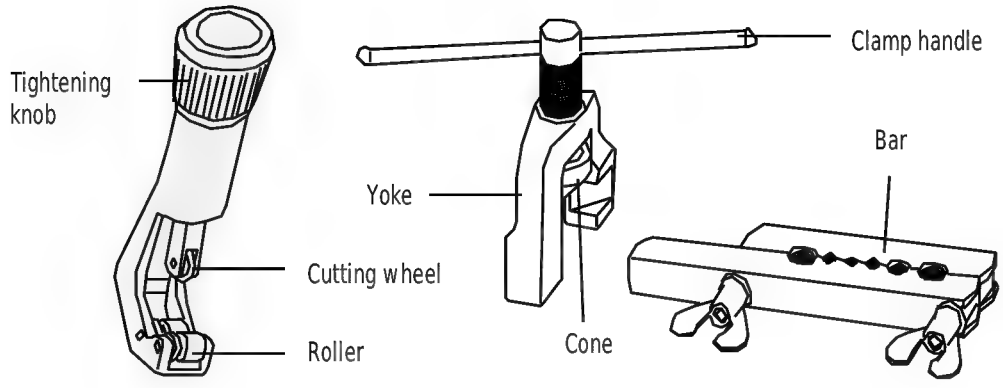
2. Use of a grounding electrode.
   - Specifications of grounding electrode.



No.	JOB	EXPLANATION	PRECAUTIONS
1	Determine the grounding position.	• Suitable location a) Place that is always dank. b) Hard soil rather than loose sandy soil. • Unsuitable location a) Where there are underground structures or facilites such as gas pipes, water pipes, telephone lines, underground cables, etc. b) A place 2m or less from the lightning arrester grounding electrode and its cable.	• Avoid sandy or gravelly soil as its grounding resistance is high. • The grounding wire for the telephone line cannot be used for the grounding of the air conditioner. • When the grounding electrode is to be installed under a place with heavy traffic, its wire must be connected firmly with the utmost care.
2	Drive the grounding electrode into position.	a) Dig a hole to the size illustrated, and drive in the grounding electrode. b) Cover the top of the grounding electrode with excavated soil.	
3	Put the grounding wire in order.	a) If the grounding wire is too short, connect an extention lead to it. Solder the joint and wrap it with tape. b) Fasten the grounding wire with staples.	• The grounding wire should be a green insulated wire of ø1.6mm or 2mm² or larger. • The soldered joint should not be buried underground.
4	Check the workmanship, and provide corrective measures if necessary.	a) After grounding work, measure the grounding resistance with a grounding resistance tester. b) If the resistance is above a specified level, drive the grounding electrode in deeper or increase the number of grounding electrodes.	
5	Connect the grounding wire to the air conditioner.	Secure the grounding wire to the grounding terminal of the air conditioner	

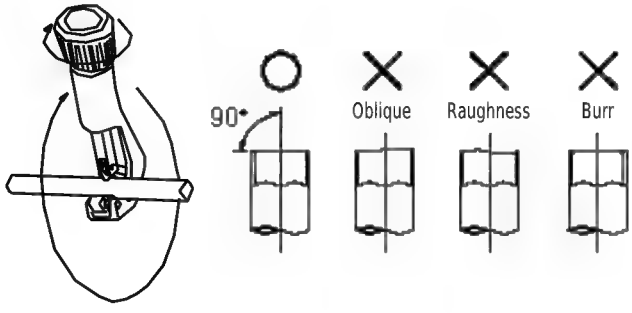
3-2-2(g) Flare modification

• Tools used



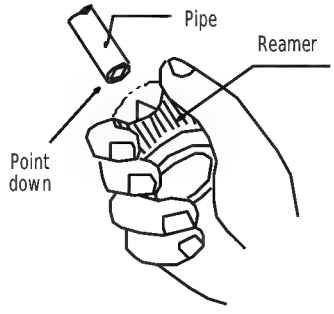
• Flare modification procedure

1) Cut the pipe using a pipe cutter.

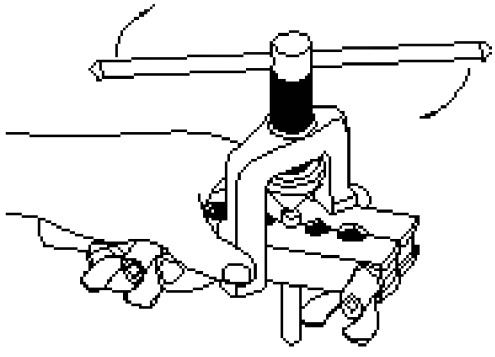


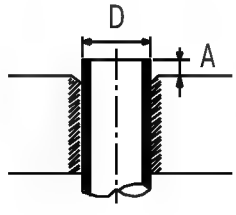
2) Remove burrs at the tip of the pipe cut.

Caution : Burrs not removed may result in leakage of gas.



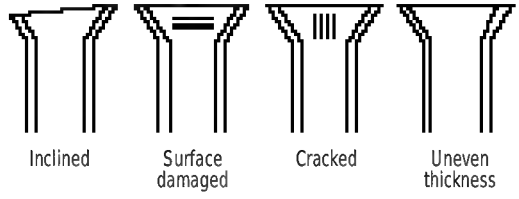
3) Insert a flare nut into the pipe and modifty flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø12.7mm	2.0
ø15.8mm	2.2

• Unproper flaring



3-2-2(h) Air-Purge Procedure

- Use the coolant of the outdoor unit to purge air inside indoor unit and pipe.

1. Remove the caps from the 2-way valve (B) and the 3-way valve(A).

2. Turn the 2-way valve cock approx. 45°∆ counterclockwise to open it. Close it about 10 seconds later.

3. Check leakage of coolant not leaking.

not leaking

Leaking
- Tighten pipe fixing area one more time and go to ®Í if gas is not leaking.
- If gas continues to leak although the pipe fixing area has been tightened again, repair the leaking area, discharge the coolant completely and refill with the required amount of new coolant.

4. Open the 2-way valve again.

5. Open the service valve cap of the 3-way valve and press the needle valve to discharge gas for 3 seconds and leave it for about 1 minute. Repeat the above procedure for 3 times to purge air.

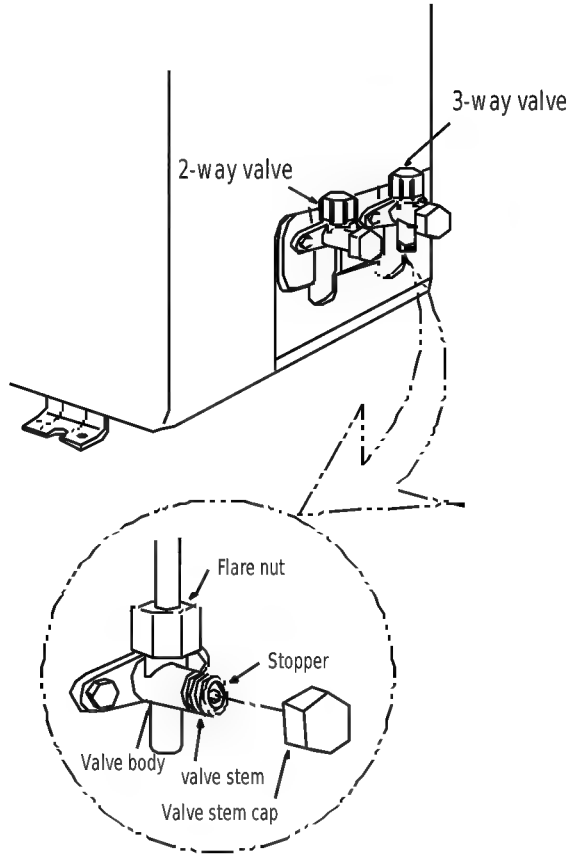
6. Open the 2-way valve and 3-way valve completely

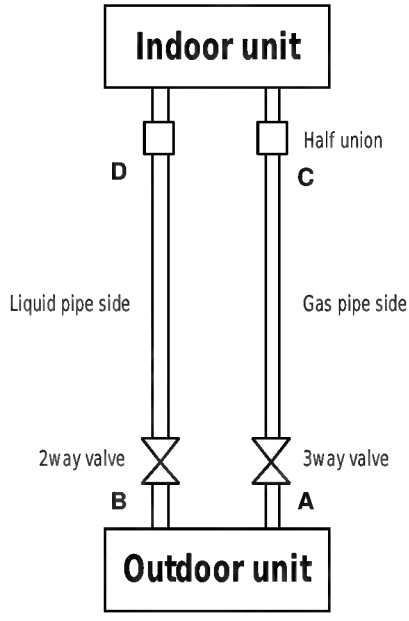
7. Close the cap of each valve.

• Valve cap tightening torque kg · cm

Model	Liquid pipe side	Gas pipe side
ASH180UE ASH181UE	160(ø6.35)	500(ø12.7)
ASH-1808DR	160(ø6.35)	500(ø12.7)
ASH-2417ER	160(ø6.35)	700(ø15.8)

8. Check each valve for leakage.

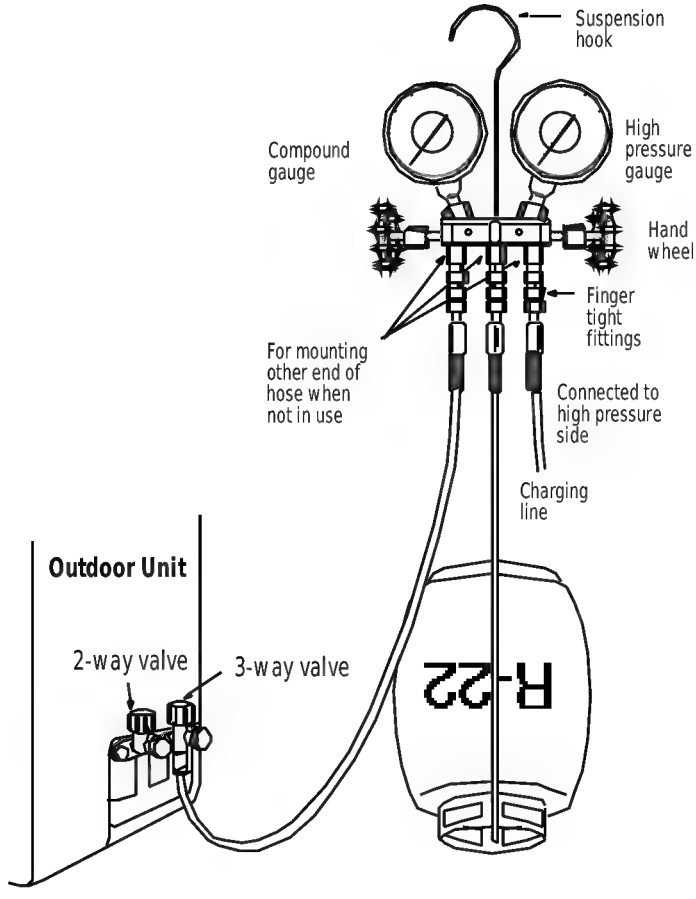




3-2-2(i) Refrigerant Refill

• Fill the airconditioner with coolant, or refill when necessary during use.

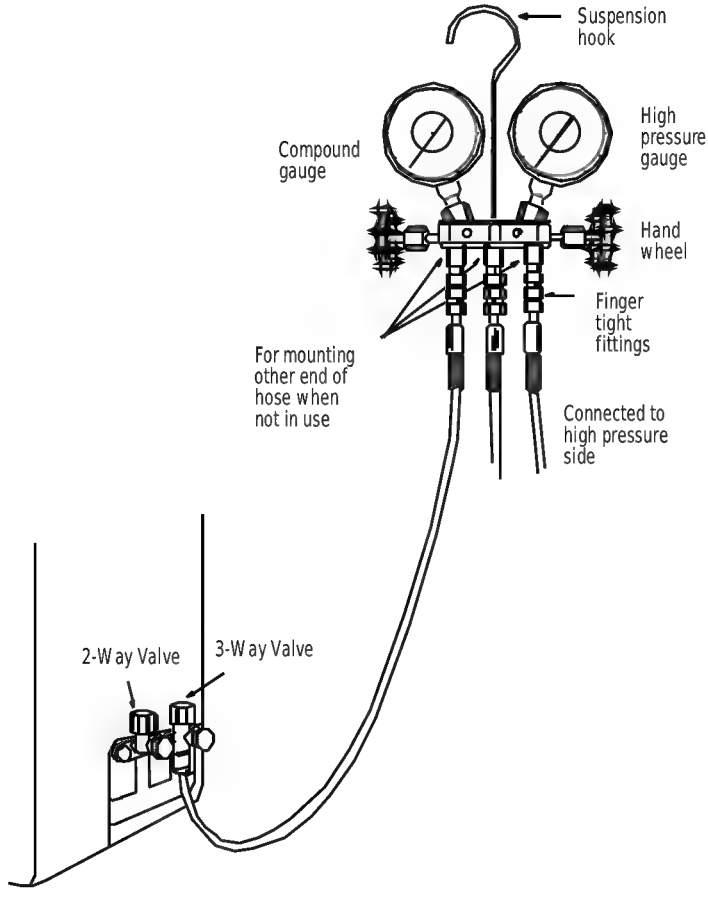
1. Purge air(for new installation only).
2. Turn the 3-way valve clockwise to close, connect the pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.
3. Connect the tank to refill with Refrigerant
4. Set the unit to cool operation mode.
5. Check the pressure indicated by the pressure gauge(low pressure side).
   * Standard pressure is should be 4.0~5.0kg/cm^2 in a regular, high operation mode.
6. Open the coolant tank and fill with coolant until the rated pressure is reached.
   * It is recommended not to pour the coolant in too quickly, but gradually while operating a pressure valve.
7. Stop operation of the airconditioner.
8. Close the 3-way valve, disconnect the pressure gauge, and open the 3-way valve again.
9. Close the cap of each valve.



3-2-2(j) "Pump Down" Procedure

- 'Pump down' shall be carried out when an evaporator is replaced or when the unit is relocated in another area.

1. Remove the caps from the 2-way valve (B) and the 3-way valve(A).
2. Turn the 3-way valve clockwise to close and connect a pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.
3. Set the unit to cool operation mode. (Check if the compressor is operating.)
4. Turn the 2-way valve clockwise to close.
5. When the pressure gauge indicates "0" turn the 3-way valve clockwise to close.
6. Stop operation of the airconditioner.
7. Close the cap of each valve.



Relocation of the airconditioner

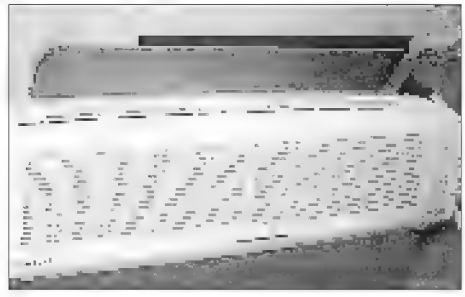
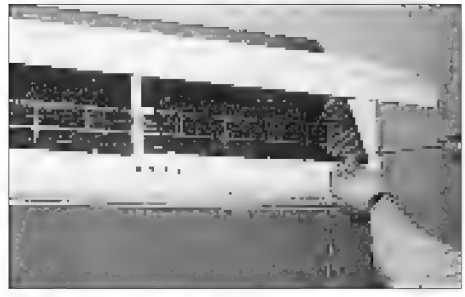
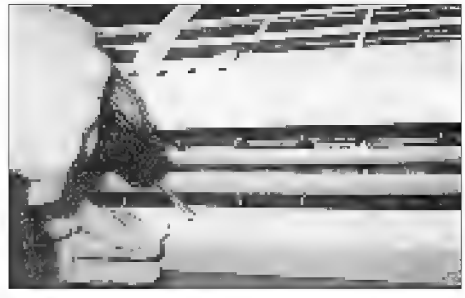
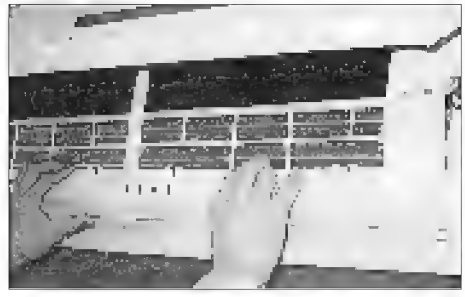
- Refer to this procedure when the unit is relocated.

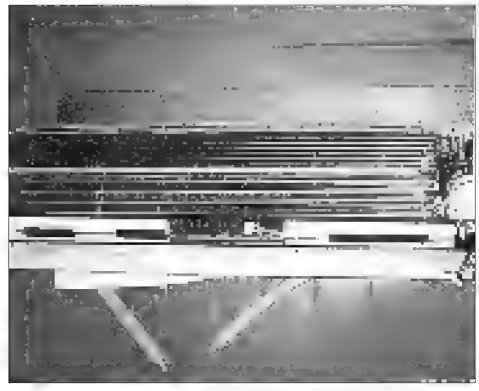
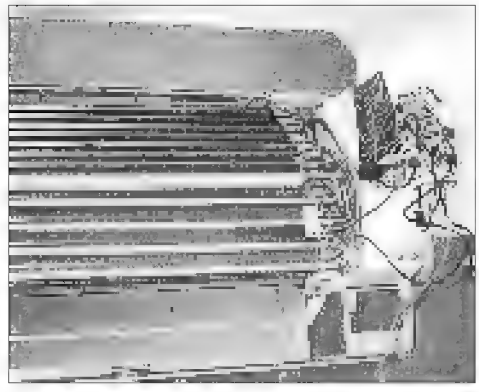
1. Carry out the pump down procedure (Refer to the details of 'pump down').
2. Remove the power cord.
3. Disconnect the assembly cable from the indoor and outdoor units.
4. Remove the flare nut connecting the indoor unit and the pipe.
   At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign materal entering.
5. Disconnect the pipe connected to the outdoor unit.
   At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
6. Make sure you do not bend the connection pipes in the middle and store together with the cables.
7. Move the indoor and outdoor units to a new locatioon.
8. Remove the mounting plate for the indoor unit and move it to a new location.

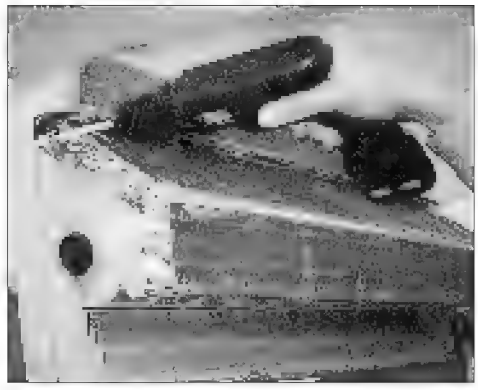
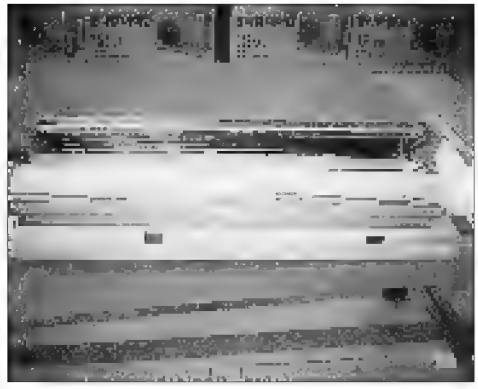
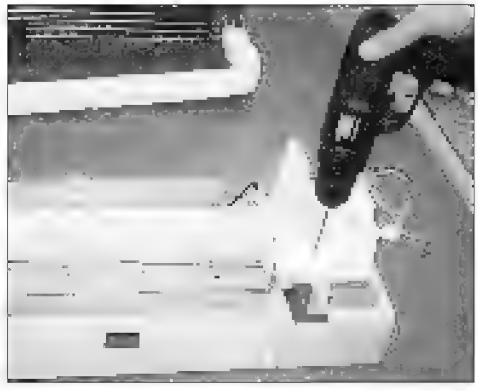
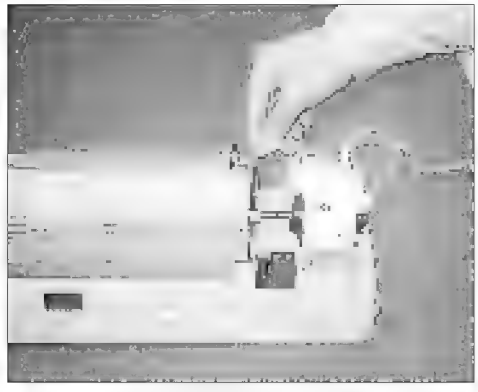
4. Disassembly and Reassembly

Stop operation of the airconditioner and remove the power plug from the wall outlet before repairing the unit

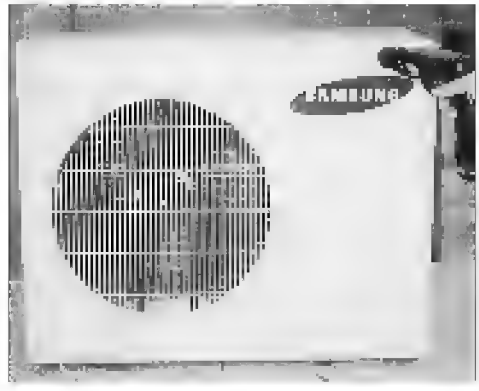
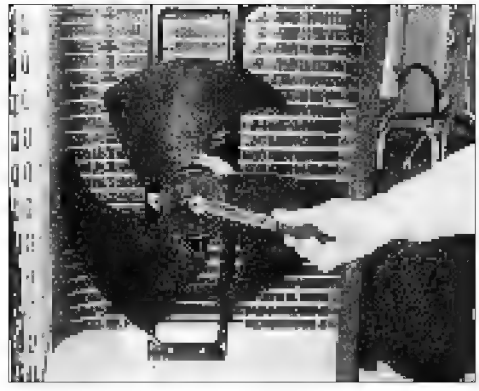
4-1 Indoor Unit

No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power. 2) Seperate the tape of front. Panel upper.	
		3) Contract the second finger to the left and right handle and pull to open the inlet grille. 4) Take the left and right filter out. 5) Loosen one of the right fixing screw and seperate the terminal cover.	
		6) Open the cover screw and loosen three fixing screws of front grille.	
		7) Pull the upper left and right of discharge softly for the outside cover to be pulled out.	
		8) Pull softly the lower part of discharge and push it up **Caution:** Assemble the front panel and fix the hooks of left and right.	

No	Parts	Procedure	Remark
2	Filter Frame	1) Loosen the left and right screw of the Holder Filter, and Separate the Holder Filter.	
3	Ass'y Tray Drain	1) Do "®Á®Ë", above. Separate the holder at the rear side of Indoor unit. 2) Take the display PCB out. (Center of indoor unit). 3) Loosen three fixing screws of left and right. 4) Pull tray drain out from the back body.	
4	Main PCB	1) Do "®Á®Ë®È", above 2) Take all the connector of PCB (2 piece) upper side out.	

No	Parts	Procedure	Remark
5	Heat Exchanger	1) Do "①②③④", above. 2) Loosen the left screws of the heat exchanger. Lifting the heat exchanger up a little to push the up side for separation from the indoor unit	 
6	Fan Motor and Cross Fan	1) Do "①②③④⑤", above. 2) Loosen the fixing two screws and separate the motor holder. 3) Loosen the fixing screw of motor fan. (By use of M3 wrench) Separate the motor from the fan. Separate the fan motor the left holder bearing.	 

4-2 Outdoor Unit

No	Parts	Procedure	Remark
1	Cabinet	1) Turn off the unit and remove the power cable 2) Remove the top cover. 3) Remove the control box cover. 4) Unplug the ass'y cable. 5) Remove the cabi-side. 6) Remove the cabi-front. * When you assemble the parts, check if the each parts and electric connectors are fixed firmly.	
2	Fan Motor & Propeller Fan	1) Do Procedure ① above. 2) Remove the nut flange. (Turn to the right to remove as it is a left turned screw) 3) Disassemble the propeller fan.	

5. Troubleshooting

5-1 Items to be checked first

1) The input voltage should be 198-264VAC.
   The air conditioner may not operate properly if the voltage is out of this range.
2) The indoor unit and the outdoor unit shall be linked by 6 cables.
   Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
   Otherwise the air conditioner may not operate properly.
3) If a problem occurs as described in the table below, it is a symptom not related to the malfunction of the air conditioner.

NO	Operation of air conditioner	Explanation
1	The operation indication LED (Green) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	• In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the compressor should operate. • In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that the compressor and indoor fan should operate.	• In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. • As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	• The speed of the indoor is changed automatically in DRY mode. • Fan speed is 4 steps is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 7 minutes (maximum) until the deice is completed.
6	Timer LED only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation
9	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

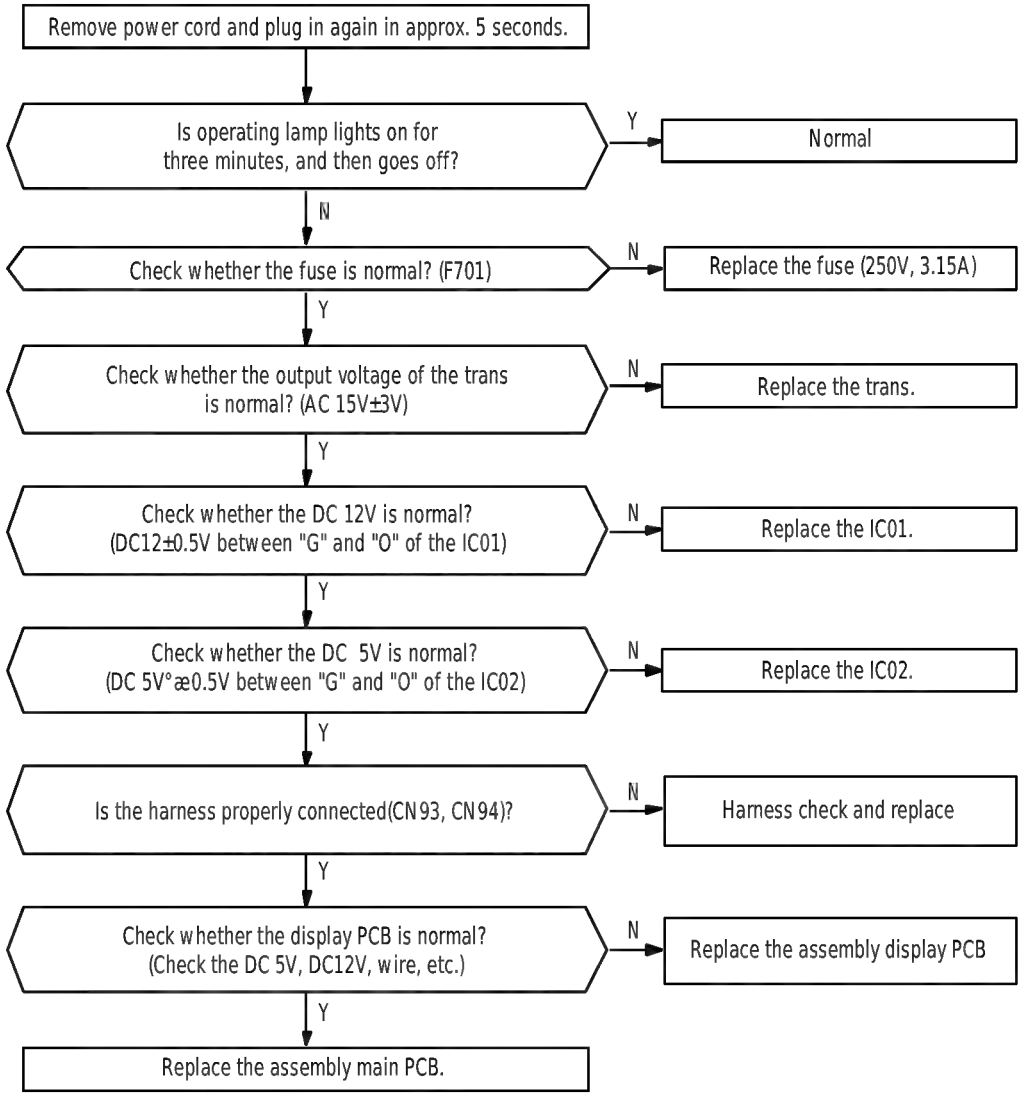
NO	Display	Self Diagnosis
1	OPERATING LED (GREEN) blinking (1Hz)	Restore from power failure (input initial power)
2	TIMER LED (YELLOW) blinking (5Hz)	Temperature sensor defective (open, short)
3	OPERATING (GREEN), TIMER LED (YELLOW) blinking (5Hz)	Indoor heat exchanger sensor defective (open, Short)
4	FAN (GREEN) LED blinking (5Hz)	Indoor fan malfunction (inoperative within 15sec -less than 600rpm)

5-2 Fault Diagnosis by Symptom

5-2-1 No Power (completely dead)-Initial diagnosis

1) Checklist :
   (1) Is input voltage normal? (198-264V~)
   (2) Is AC power linked correctly?
   (3) Are connections between primary side, secondary side of the power transformer and PCB good.
   (4) Is output voltage of DC regulator IC KA7812(IC01) normal? (11.5VDC-12.5VDC)
   (5) Is output voltage of DC regulator IC KA7805(IC02) normal? (4.5VDC-5.5VDC)

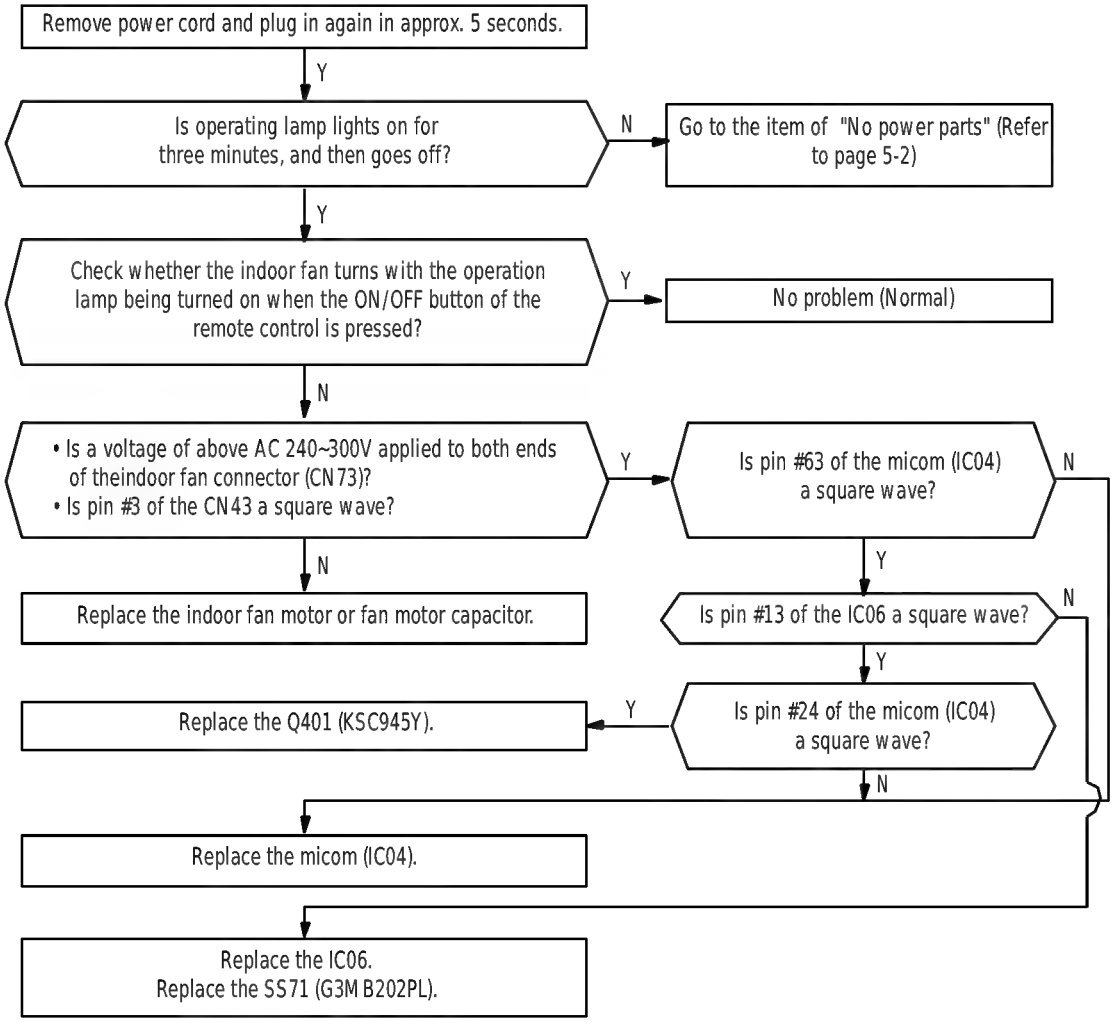
2) Troubleshooting procedure


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp lights on for three minutes, and then goes off?
Y
Normal
N
Check whether the fuse is normal? (F701)
N
Replace the fuse (250V, 3.15A)
Y
Check whether the output voltage of the trans is normal? (AC 15V±3V)
N
Replace the trans.
Y
Check whether the DC 12V is normal? (DC12±0.5V between "G" and "O" of the IC01)
N
Replace the IC01.
Y
Check whether the DC 5V is normal? (DC 5V°æ0.5V between "G" and "O" of the IC02)
N
Replace the IC02.
Y
Is the harness properly connected(CN93, CN94)?
N
Harness check and replace
Y
Check whether the display PCB is normal? (Check the DC 5V, DC12V, wire, etc.)
N
Replace the assembly display PCB
Y
Replace the assembly main PCB.

5-2-2 When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is input voltage normal? (198-264V~)
   (2) Is the indoor unit fan properly connected(CN73)?
   (3) Is the starting codenser CR 71 properly soldered?
   (4) Is HALL IC in indoor fan motor properly connected(CN43)?
   (5) When in operation mode, does the indoor unit fan operate?

2) Troubleshooting procedure

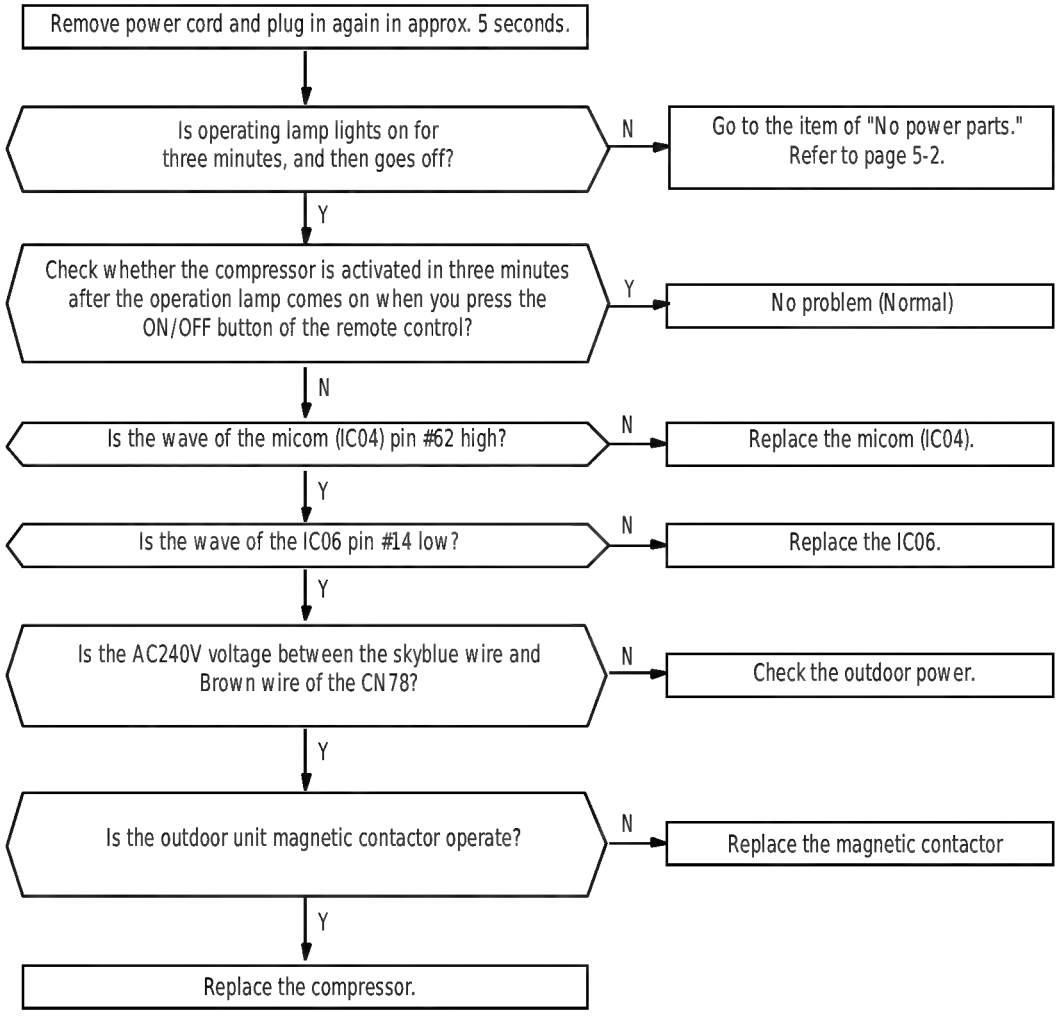

Remove power cord and plug in again in approx. 5 seconds.
Y
Is operating lamp lights on for three minutes, and then goes off?
N
Go to the item of "No power parts" (Refer to page 5-2)
Y
Check whether the indoor fan turns with the operation lamp being turned on when the ON/OFF button of the remote control is pressed?
Y
No problem (Normal)
N
• Is a voltage of above AC 240~300V applied to both ends of theindoor fan connector (CN73)?
• Is pin #3 of the CN43 a square wave?
Y
Is pin #63 of the micom (IC04) a square wave?
N
N
Y
Replace the indoor fan motor or fan motor capacitor.
Is pin #13 of the IC06 a square wave?
N
Y
Y
Replace the Q401 (KSC945Y).
Is pin #24 of the micom (IC04) a square wave?
N
Replace the micom (IC04).
Replace the IC06.
Replace the SS71 (G3MB202PL).

5-2-3 When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

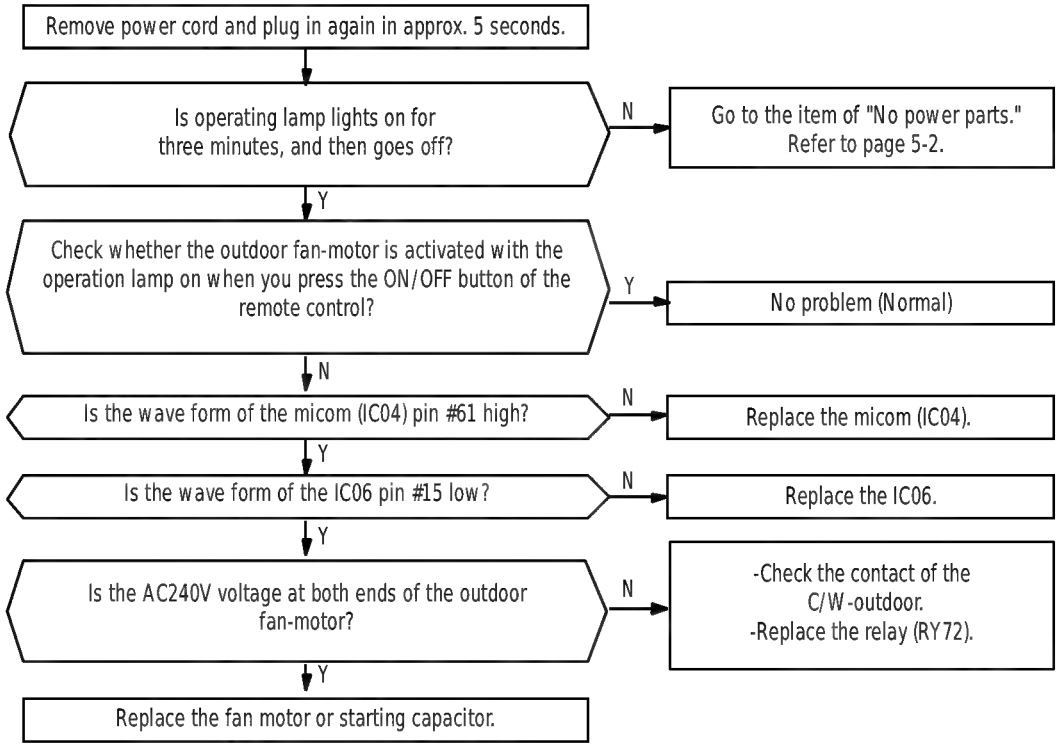
1) Checklist :
   (1) Is input voltage normal? (198-264V~)
   (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
   (3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
   (4) Is the CONNECTOR-WIRE OUTDOOR linked correctly?
   (5) Is the indoor unit wire properly connected with the outdoor unit wire?

2) Troubleshooting procedure

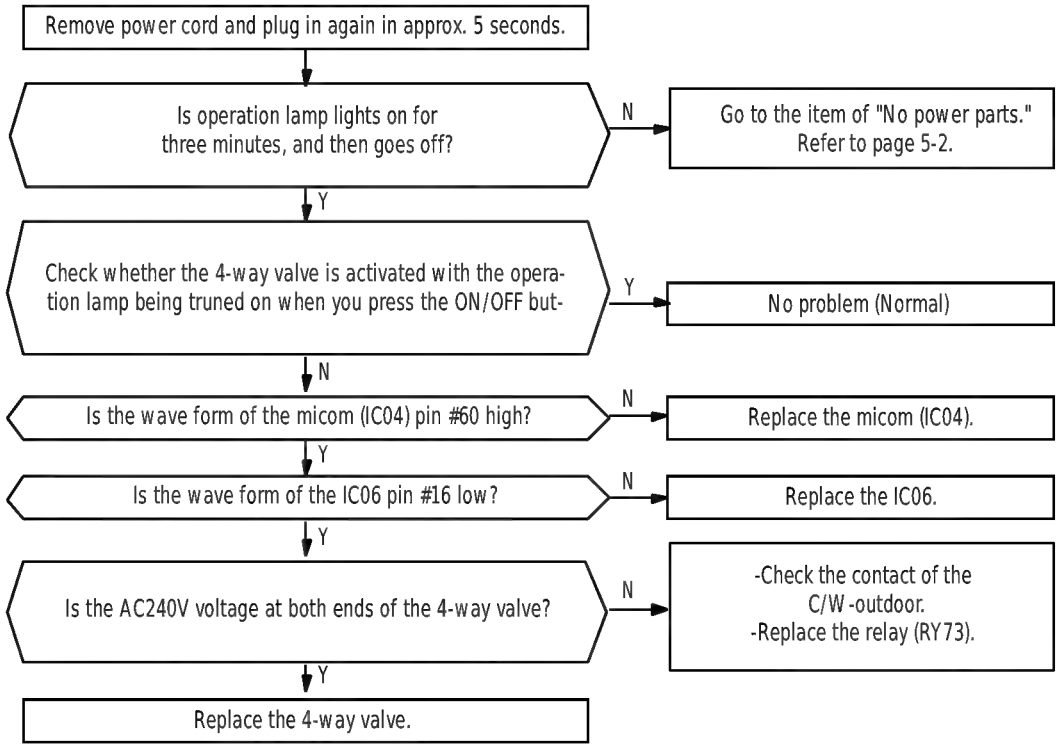
   ① Compressor


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp lights on for three minutes, and then goes off?
N
Go to the item of "No power parts." Refer to page 5-2.
Y
Check whether the compressor is activated in three minutes after the operation lamp comes on when you press the ON/OFF button of the remote control?
Y
No problem (Normal)
N
Is the wave of the micom (IC04) pin #62 high?
N
Replace the micom (IC04).
Y
Is the wave of the IC06 pin #14 low?
N
Replace the IC06.
Y
Is the AC240V voltage between the skyblue wire and Brown wire of the CN78?
N
Check the outdoor power.
Y
Is the outdoor unit magnetic contactor operate?
N
Replace the magnetic contactor
Y
Replace the compressor.

② Outdoor Fan-Motor


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp lights on for three minutes, and then goes off?
N
Go to the item of "No power parts." Refer to page 5-2.
Y
Check whether the outdoor fan-motor is activated with the operation lamp on when you press the ON/OFF button of the remote control?
Y
No problem (Normal)
N
Is the wave form of the micom (IC04) pin #61 high?
N
Replace the micom (IC04).
Y
Is the wave form of the IC06 pin #15 low?
N
Replace the IC06.
Y
Is the AC240V voltage at both ends of the outdoor fan-motor?
N
-Check the contact of the C/W-outdoor.
-Replace the relay (RY72).
Y
Replace the fan motor or starting capacitor.

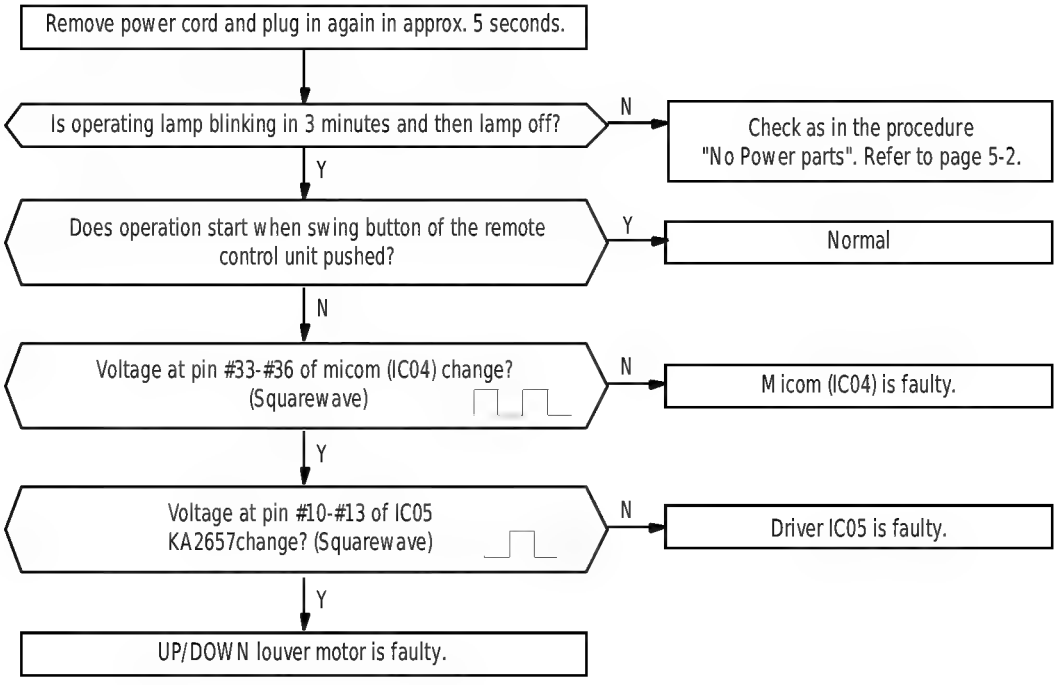
③ 4-Way valve (Check it in the heat mode.)


Remove power cord and plug in again in approx. 5 seconds.
Is operation lamp lights on for three minutes, and then goes off?
N
Go to the item of "No power parts." Refer to page 5-2.
Y
Check whether the 4-way valve is activated with the operation lamp being truned on when you press the ON/OFF but-
Y
No problem (Normal)
N
Is the wave form of the micom (IC04) pin #60 high?
N
Replace the micom (IC04).
Y
Is the wave form of the IC06 pin #16 low?
N
Replace the IC06.
Y
Is the AC240V voltage at both ends of the 4-way valve?
N
-Check the contact of the C/W-outdoor.
-Replace the relay (RY73).
Y
Replace the 4-way valve.

5-2-4 When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is input voltage normal? (198-264V~)
   (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?

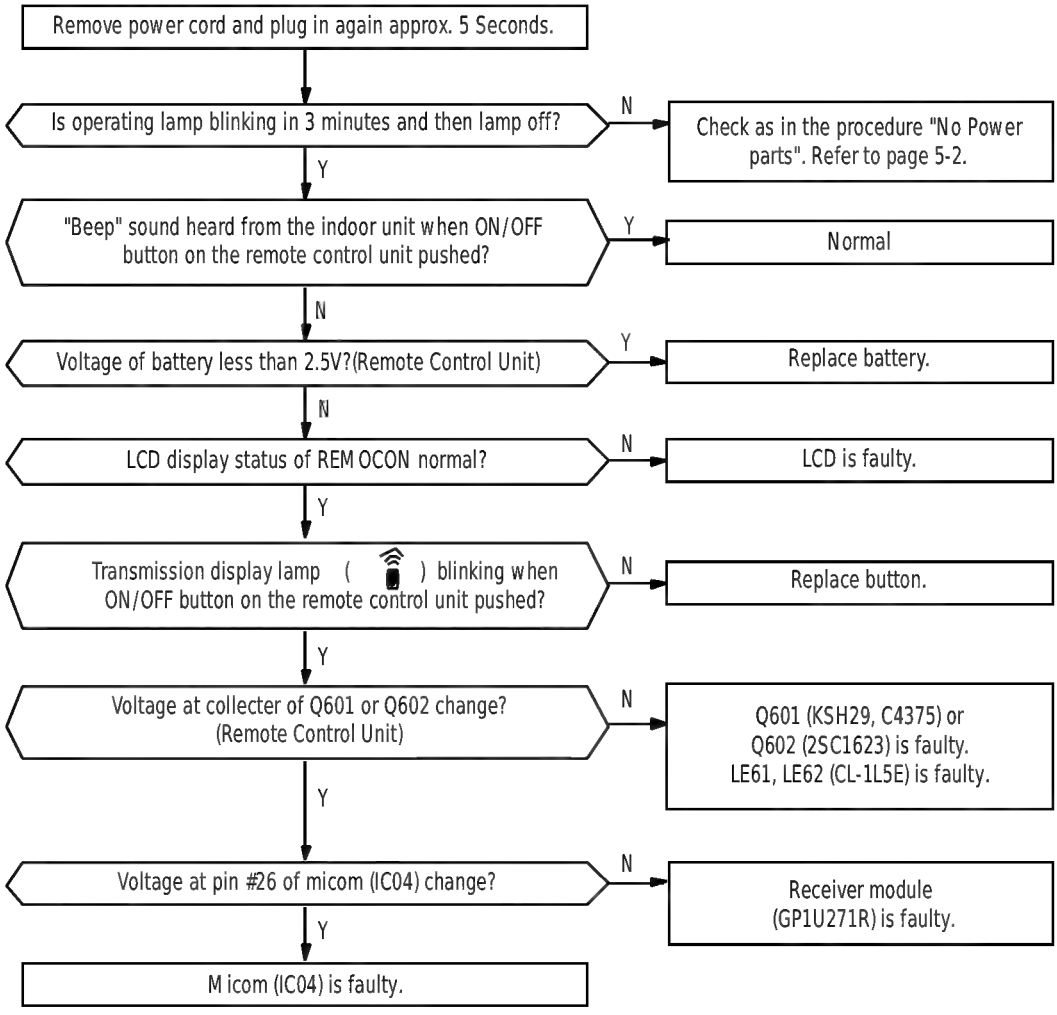
2) Troubleshooting procedure


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp blinking in 3 minutes and then lamp off?
N
Check as in the procedure "No Power parts". Refer to page 5-2.
Y
Does operation start when swing button of the remote control unit pushed?
Y
Normal
N
Voltage at pin #33-#36 of micom (IC04) change? (Squarewave)
N
Micom (IC04) is faulty.
Y
Voltage at pin #10-#13 of IC05 KA2657change? (Squarewave)
N
Driver IC05 is faulty.
Y
UP/DOWN louver motor is faulty.

5-2-5 If Operation By Remote Control Unit is Impossible. (Initial Diagnosis)

1) Checklist :
   (1) Is operation selector switch of the indoor unit set at "REMOTE"?

2) Troubleshooting procedure


Remove power cord and plug in again approx. 5 Seconds.
Is operating lamp blinking in 3 minutes and then lamp off?
N
Check as in the procedure "No Power parts". Refer to page 5-2.
Y
"Beep" sound heard from the indoor unit when ON/OFF button on the remote control unit pushed?
Y
Normal
N
Voltage of battery less than 2.5V?(Remote Control Unit)
Y
Replace battery.
N
LCD display status of REMOCON normal?
N
LCD is faulty.
Y
Transmission display lamp ( ) blinking when ON/OFF button on the remote control unit pushed?
N
Replace button.
Y
Voltage at collecter of Q601 or Q602 change? (Remote Control Unit)
N
Q601 (KSH29, C4375) or Q602 (2SC1623) is faulty. LE61, LE62 (CL-1L5E) is faulty.
Y
Voltage at pin #26 of micom (IC04) change?
N
Receiver module (GP1U271R) is faulty.
Y
Micom (IC04) is faulty.

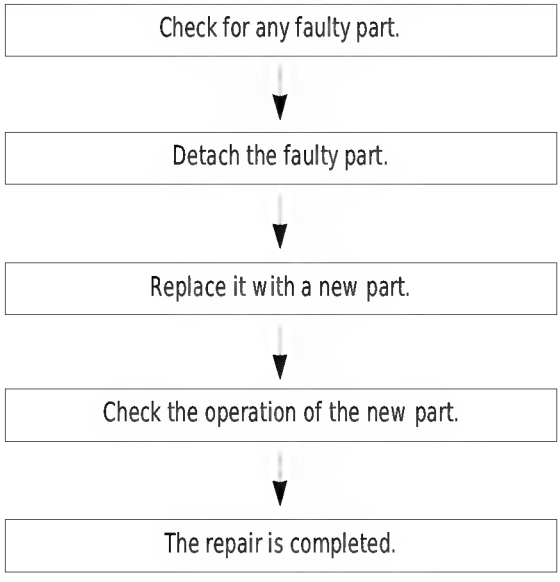
5-3 PCB Inspection

5-3-1 Cautions for Part Replacement

1. The human body carries much static electricity. Before touching a part for repair, replacement or the similar purpose, be sure to touch a grounded metallic portion by hand to let the static electricity go through the matallic portion to the earth.
   Especially when handling any micro computer or IC, carefully remove such static electricity before touching them.
2. When repairing any part on a work bench, be sure to place an insulative sheet on the bench and always keep the sheet surface neat without any metal fragments. If any such fragment touches a part, a secondary trouble will possibly be caused in the part.
3. Before replacing any parts, be sure to turn off the power supply. If such replacement is done with the power supply kept on, an electric shock, short circuit or destruction of a part may result.
4. During replacement or repair of a part, carefully handle it : The printed circuit board has fine lead wires (jumper wires) and glass-made parts (diode) on its substrate.
   So if a circuit board is roughly handled, such lead wires and parts will be easily broken or damaged by bending or shock.
5. When soldering the lead wires of any new part, be sure to polish them using an emery paper or the like before solding them. Since the lead wires of any new part are covered with an oxide film, solder cannot adhere to the lead wires if not polished.
6. When soldering any part, care should be exercised not to apply any high-wattage soldering iron to the part for a long time. Some parts are of so low a heat resistance that they may be broken or have the properties changed if a soldering iron is so applied (Otherwise, the pattern may possibly be separated and raised).
7. The heat of the soldering iron should be transfered to the entire object to be soldered. If the solder pieces are not well fused due to insufficient transfer of the heat from the soldering iron, no satisfactory electrical continuity can be assured even if the soldered objects appear well connected to each other.
8. The solder used should be limited to a minimum. If excessive solder is used, it will cause inter-pattern contact, which may cause malfunction of the circuit.

5-3-2 Procedure

The parts should be replaced in the following procedure.


Check for any faulty part.
Detach the faulty part.
Replace it with a new part.
Check the operation of the new part.
The repair is completed.

5-3-3 Detailed Procedure

No.	Malfunction	Checking point (symptoms)	Causes
1	Pull out the power plug from the AC terminal and check the fuse on the PCB assembly	1 Is the fuse blown?	1. Voltage over 2. Indoor unit fan motor short-circuit.
2	Ture the power on. If lamp blinks trouble is not related to the items 1 through 4 on the right.	Voltage check	
		1. AC voltage at both end of transformer Primary? 198 - 264V~	1. Irregular power code or power fuse, or poor wiring.
		2. AC voltage at both end of transformer secondary? 15 - 25V~	2. Transformer is faulty.
		3. DC voltage at OUT and GND of IC01 (KA7812)? 12VDC	3. Power circuit is faulty.
		4. DC voltage at OUT and GND of IC02? 5VDC	4. Power circuit is faulty.
		5. DC voltage at Q201 Base and GND change? squarewave	5. Q201 is faulty. D101~D105 (D4G*4) is faulty.
3	Set operating mode when RMC switch pushed. 1. COOL mode 2. Fan speed [AUTO] 3. Set temperature lower than room temperature 4. Continuous operation.	1. Compressor does not operate.	1. Temperature of Heat exchange is lower.
			2. PCB is faulty.
4	Set operating mode when RMC switch pushed. 1. HEAT mode 2. Fan speed [AUTO] 3. Set temperature higher than room temperature 4. Continuous operation	1. Compressor does not operate	1. Temperature of Heat exchange is higher. 2. PCB is faulty.
5	Set operating mode when RMC switch pushed. 1. [FAN] mode 2. Fan speed [HI] 3. Continuous operation	1. Voltage at ③⑤ both ends of CN73 : above 190V~ 2. Indoor unit fan motor does not operate.	1. Indoor unit fan motor is faulty. 2. Poor connection of indoor fan motor and connector of RPM sensing (CN43)

5-4 Fault Diagnosis of Major Parts

<table>
<tr><th>Parts</th><th colspan="2">Diagnosis</th></tr>
<tr><td rowspan="3">Temp.Sensor

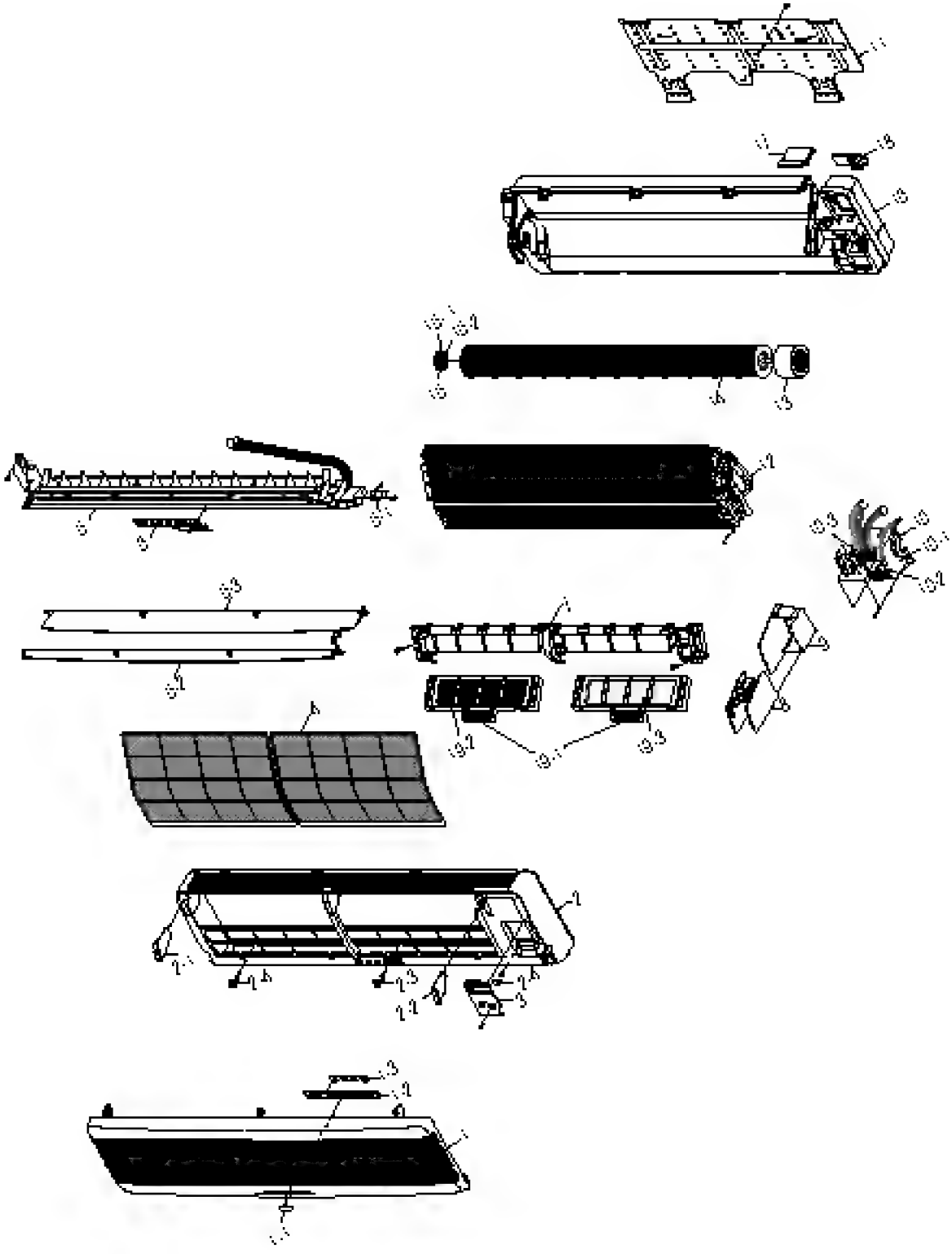
Heat ex. Sensor</td><td colspan="2">Measure resistance with a tester.</td></tr>
<tr><td>Normal</td><td>8KΩ~27KΩ at ambient temperature (+0°C ~ +30°C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω ... open or short</td></tr>
<tr><td rowspan="6">Indoor Fan Motor</td><td colspan="2">Measure resistance between terminals (CN73) with a tester</td></tr>
<tr><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table><tr><th>between</th><th>Resistance</th></tr><tr><td>Yellow, Blu</td><td>190±10Ω</td></tr><tr><td>Yellow, Red</td><td>240±15Ω</td></tr></table></td></tr>
<tr><td>Abnormal</td><td></td></tr>
<tr><td colspan="2">Measure the voltage between ground and signal wire of the fan motor</td></tr>
<tr><td>Normal</td><td><table><tr><th>between</th><th>Voltage</th></tr><tr><td>Gray, Orange</td><td>0.5V~4.5V</td></tr><tr><td>Yellow, Orange</td><td>5V</td></tr></table></td></tr>
<tr><td>Abnormal</td><td>Abnormal if voltage does not change from 0V to 5V.</td></tr>
<tr><td rowspan="2">Outdoor Fan Motor</td><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table><tr><th>between</th><th>Resistance</th></tr><tr><td>Black, Yellow</td><td>180±10Ω</td></tr><tr><td>Black, Red</td><td>220±10Ω</td></tr></table></td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω ... open or short</td></tr>
<tr><td rowspan="3">Stepping Motor

(UP/DOWN swing motor)</td><td colspan="2">Measure resistance between red wire and each terminal.</td></tr>
<tr><td>Normal</td><td>Approx. 380Ω at ambient temperature (20°C ~30°C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω ... open or short</td></tr>
</table>

MEMO

6. Exploded Views and Parts List

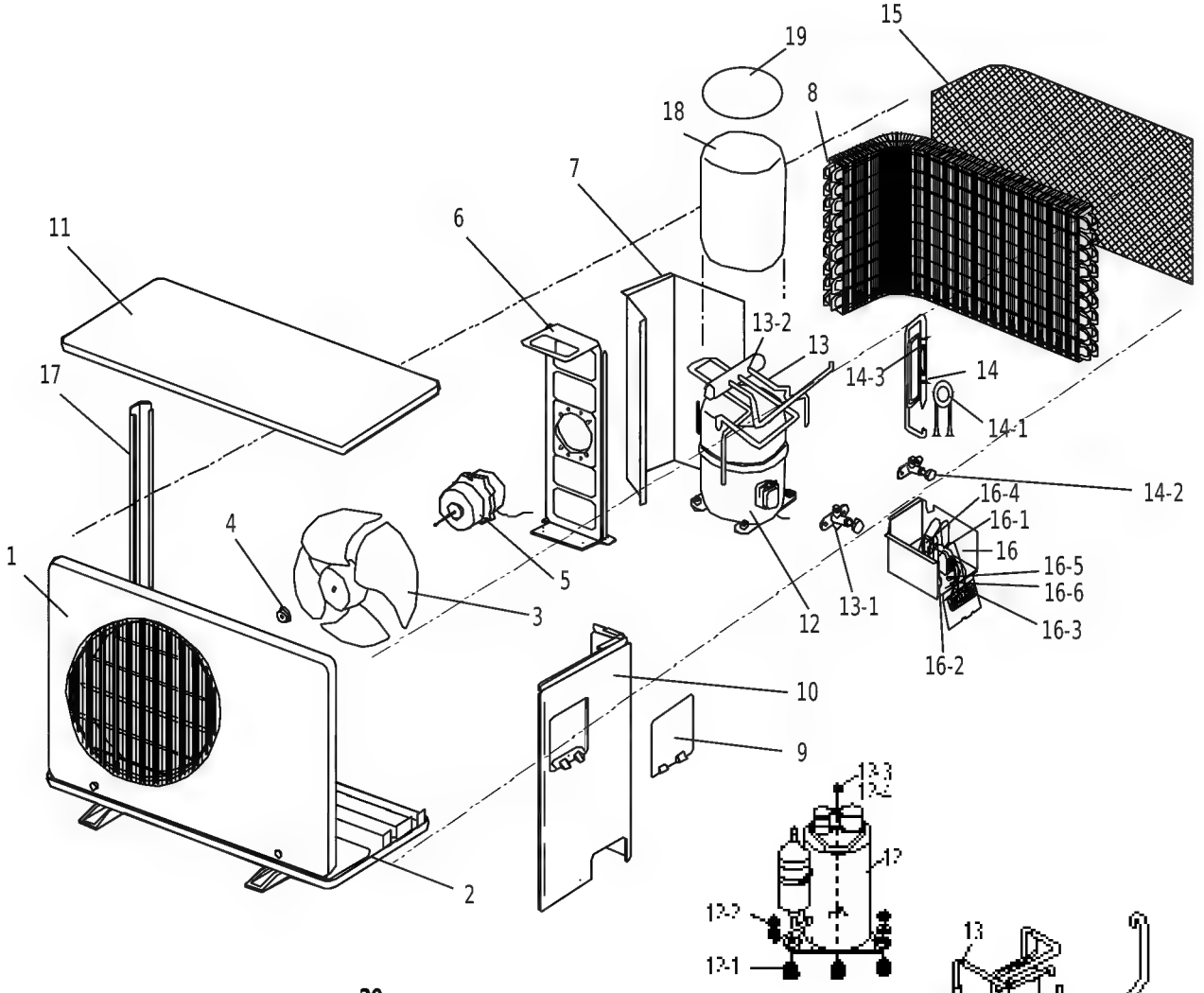
6-1 Indoor Unit



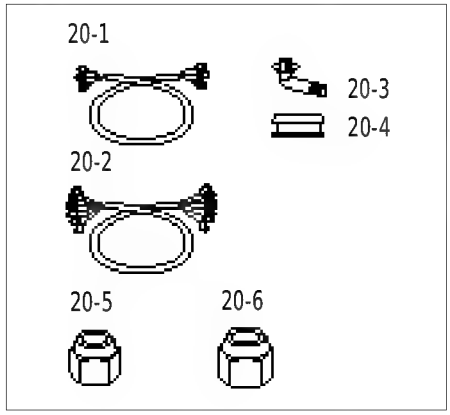
■ Parts List

No.	CODE NO	Description	Specification	Q'TY				Remark
				ASH180UE	ASH181UE	ASH-2417ER	ASH-1808DR	
1	DB92-10285L	ASS'Y GRILLE	ASS'Y	1	1	1	1	
1-1	DB64-40155A	WINDOR-FILTER	PC	1	1	1	1	
1-2	DB64-70069A	PANEL-CENTER DISPLAY	ABS	1	1	1	1	
1-3	DB64-70068A	PANEL-LED CENTER	PC	1	1	1	1	
2	DB64-70067B	PANEL-FRONT	HIPS	1	1	1	1	
2-1	DB92-10287A	ASS'Y-GRILLE SUPPORT	ABS	1	1	1	1	
2-2	DB92-10289A	ASS'Y-SUPPORT RH	ABS	1	1	1	1	
2-3	DB63-10404E	COVER-SCREW M	ABS	1	1	1	1	
2-4	DB63-10404F	COVER-SCREW LF	ABS	2	2	2	2	
3	DB63-10403C	COVER-TERMINAL	HIPS	1	1	1		
	DB63-10403D	COVER-TERMINAL	HIPS	-	-	-	1	
4	DB63-30128A	GUARD-FILTER AIR	PP	2	2	2	2	
5	DB94-10072E	ASS'Y-TRAY DRAIN	ASS'Y	1	1	1	1	
5-1	DB31-10116C	MOTOR-STEPPING	MP35EA	1	1	1	1	⚠
5-2	DB66-30151A	BLADE-H UPP	PC-ABS	1	1	1	1	
5-3	DB66-30138C	BLADE-H LOW	HIPS	1	1	1	1	
6	DB93-10436A	ASSY-PCB SUB	ASH180UE	1	1	1	1	
7	DB61-40228A	HOLDER-E FILTER	HIPS	1	1	1	1	
8	DB93-10521A	ASS'Y-PCB MAIN	ASH180UE	1	1	-	-	⚠
	DB93-10442A	ASS'Y-PCB MAIN	ASH-1808DR	-	-	-	1	⚠
	DB93-10435A	ASS'Y-PCB MAIN	ASH-2417ER	-	-	1	-	⚠
9	DB61-10122A	CASE-CONTROL	PP	1	1	1	1	
10	DB61-40254A	ASS'Y-HOLDER-MOTOR	ASS'Y	1	1	1	1	
10-1	DB61-40052A	HOLDER-MOTOR	PP	1	1	1	1	
10-2	DB65-10102A	CLIP-EARTH WIRE	SECC	1	1	1	1	
10-3	DB65-40058A	TERMINAL-BLOCK	ASS'Y	1	1	1	1	
11	DB70-10589A	PLATE-HANGER	SGCC-M	1	1	1	1	
12	DB75-40069A	ASS'Y-EVAP	PLATE1.2(1/2")	-	-	-	1	
	DB75-40079A	ASS'Y-EVAP	PLATE1.2(1/2")	1	1	-	-	
	DB75-40067A	ASS'Y-EVAP	PLATE1.2(5/8")	-	-	1	-	
13	DB31-10078E	MOTOR-FAN IN	AMPAS-040AVEA	1	1	1	1	⚠
14	DB94-30133B	ASS'Y-FAN CROSS	RANDOM 12P	1	1	1	1	
15	DB94-40017A	ASS'Y-BEARING	ASS'Y	1	1	1	1	
15-1	DB73-20091A	RUBBER BEARING	CR	1	1	1	1	
15-2	DB94-40007A	BEARING	PG5	1	1	1	1	
16	DB94-20032A	ASS'Y-BACK BODY	ASS'Y	1	1	1	1	
17	DB61-60090B	BODY-BUSH	HIPS	1	1	1	1	
18	DB61-40247A	HOLDER-PIPE	PP	1	1	1	1	
19	DB97-30170A	ASS'Y-FILTER	ASS'Y	-	1	-	-	
19-1	DB63-30008A	GUARA-CLEANER FILTER		-	1	-	-	
19-2	DB91-20064A	ASS'Y-DEODORIFILTER		-	1	-	-	
19-3	DB91-20063A	ASS'Y-ELECTRIC FILTER		-	1	-	-	

6-2 Outdoor Unit



20



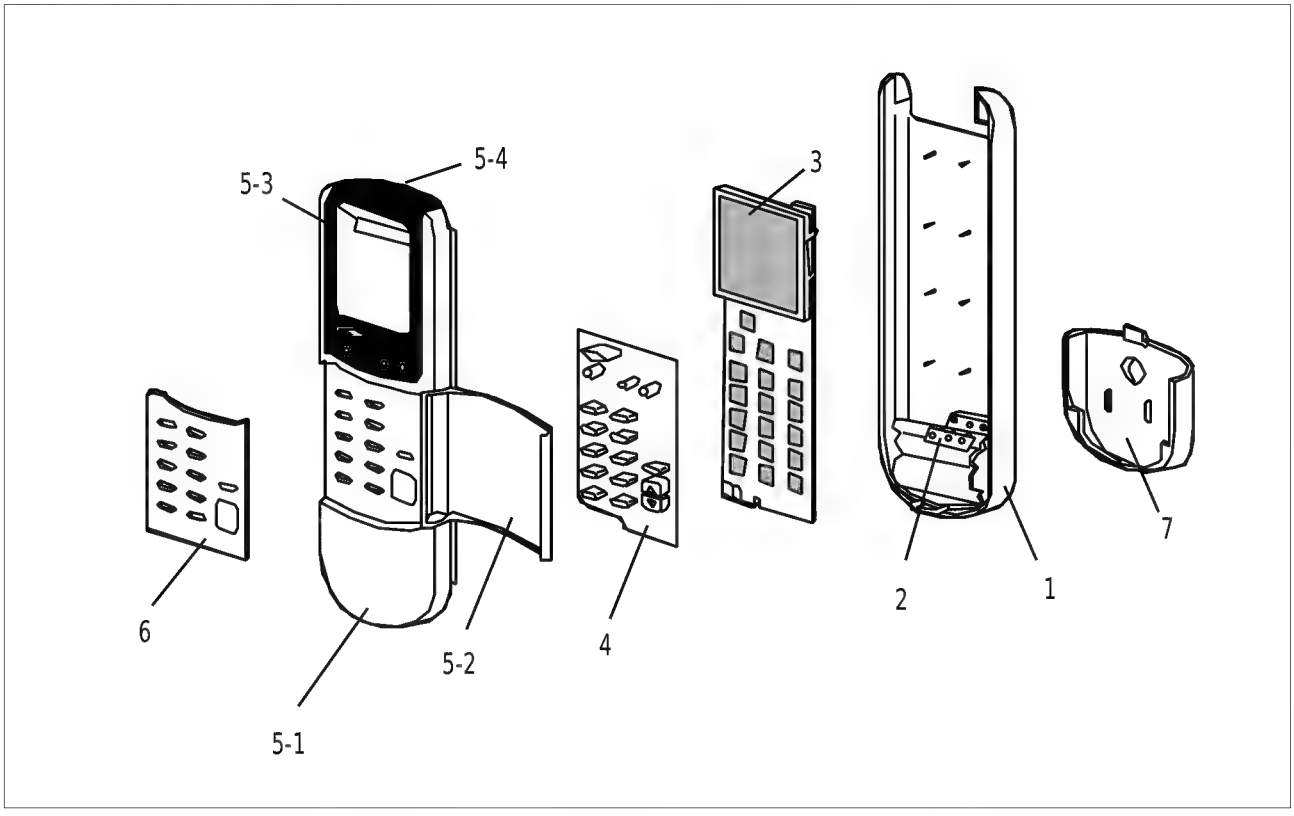
■ Parts List

No.	CODE NO	Description	Specification	Q'TY			Remark
				ASH180UE/181UE	ASH-2417ER	ASH-1808DR	
1	DB90-10153J	ASS'Y WELD FRONT	ACRYL-CO, SC-90073T	1	1	1	
2	DB90-20160C	ASS'Y BASE OUT	ACRYL-CO, SC-90073T	1	1	1	
3	DB67-50063A	ASS'Y FAN	AS G/F 20%	1	1	1	
4	DB60-30020A	NUT FLANGE	M6LF	1	1	1	
5	DB31-10119C	MOTOR FAN OUT	AMASS-035AVEB	1	1	1	⚠
6	DB61-20008C	BASE MOTOR	SGCC-M(Z22)	1	1	1	
7	DB67-30014A	PARTITION	SGCC-M(Z22)	1	1	1	
8	DB75-30076A	ASS'Y CONDENSER	ASS'Y	-	1	1	
	DB75-30092A	ASS'Y CONDENSER	ASS'Y	1	-	-	
9	DB63-10415A	COVER CONTROL	ABS, SC-90073R	1	1	1	
10	DB64-60043F	CABI SIDE OUT	SC-90073T	1	1	1	
11	DB63-10011A	TOP COVER	SC-90073T	1	1	1	
12	DB95-10263B	COMPRESSOR	SAMSUNG(48B180J V1E7)	1	-	-	⚠
	DB95-10260A	COMPRESSOR	BRISTOL(H23B30QABKA)	-	1	-	
	DB95-10284A	COMPRESSOR	BRISTOL(H23B24QABJA)	-	-	1	
12-1	DB73-10004A	GROMMET-ISOLATOR	EPDM	3	-	-	
12-2	DB60-30028A	NUT-WASHER	M8	3	-	-	
12-3	DB60-30018A	NUT-FLANGE	P10.8	1	-	-	
12-4	DB63-10165A	COVER-TERMINAL	NORYL	1	-	-	
13	DB99-10102A	ASS'Y 4-WAY V/V	ASS'Y	1	-	-	
	DB99-10065A	ASS'Y 4-WAY V/V	ASS'Y	-	1	-	
	DB99-10065B	ASS'Y 4-WAY V/V	ASS'Y	-	-	1	
13-1	DB62-40022A	PACKED VALVE 1/2"	10LT/MIN, 1/2 INCH	1	-	1	
	DB62-40055F	PACKED VALVE 5/8"	20LT/MIN, 5/8 INCH	-	1	-	
13-2	DB62-40036A	4 WAY VALUE	CHV-0201	1	1	1	
14	DB99-10066B	ASS'Y CHECK V/V	ASS'Y	-	-	1	
	DB99-10116A	ASS'Y CHECK V/V	ASS'Y	1	-	-	
	DB99-10066A	ASS'Y CHECK V/V	ASS'Y	-	1	-	
14-1	DB62-31749A	TUBE CAPI(C)	ø2.0 X 900	1	-	-	
	DB62-31424A	TUBE CAPI(C)	ø1.5 X 850	-	1	-	
	DB62-31425A	TUBE CAPI(C)	ø1.5 X 900	-	-	1	
14-2	DB62-40039C	PACKED VALUE 1/4"	1/4 inch	1	1	1	
14-3	DB62-31426A	TUBE CAPI(H)	ø2.0 X 500	-	1	1	
	DB62-31748A	TUBE CAPI(H)	ø2.0 X 1200	1	-	-	
15	DB63-30130C	SCREEN	PHF 100%	1	1	1	
16	DB93-40680A	ASS'Y CONTROL OUT	ASS'Y	1	-	-	SNA
	DB93-40566A	ASS'Y CONTROL OUT	ASS'Y	-	1	-	SNA
	DB93-40689A	ASS'Y CONTROL OUT	ASS'Y	-	-	1	SNA
16-1	DB34-90054A	SWITCH MAGNETIC	FURNAS	1	1	1	⚠
16-2	2501-001044	CAPACITOR DUAL	40/2.5µF 450VAC	1	-	-	⚠
	2501-001076	CAPACITOR COMP	450VAC X 45µF	-	1	-	⚠
	2501-000390	CAPACITOR COMP	420VAC X 40µF	-	-	1	⚠
16-3	DB65-40022C	TERMINAL BLOCK	7P	1	1	1	
16-4	2501-001066	CAPACITOR FAN	450VAC X 2.5µF	-	1	1	⚠
16-5	DB47-90002A	SPARK KILLER		1	1	1	⚠
16-6	3601-000236	FUSE	2A, 250V~	1	1	1	
17	DB63-30025D	GUARD COND	SC-90073T	1	1	1	
18	DB72-50537A	CLOTH SOUND	-	1	-	1	
	DB72-50543A	CLOTH SOUND	-	-	1	-	
19	DB72-50544A	CLOTH SOUND UP	-	1	1	1	
20-1	DB39-20041C	CONNECTOR POWER	3G, 2.5mm^2	1	1	1	
20-2	DB39-20443A	CONNECTOR WIRE	6G	1	1	-	
	DB39-20444A	CONNECTOR WIRE	6G	-	-	1	
20-3	DB67-20011A	DRAIN PLUG OUT	PP	1	1	1	
20-4	DB63-10355C	CAP DRAIN	CR	1	1	1	
20-5	DB60-30010A	NUT FLARE 1/4"	C3771BD	2	2	2	
20-6	DB60-30010C	NUT FLARE 1/2"	C3771BD	2	-	2	
	DB60-30010D	NUT FLARE 5/8"	C3771BD	-	2	-	

•No20-1, 20-2:H05RN-F & H07RN-F(Approved according to IEC standard)(ONLY ASH180UE/2417ER)

6-3 Remote Control & PCB Box

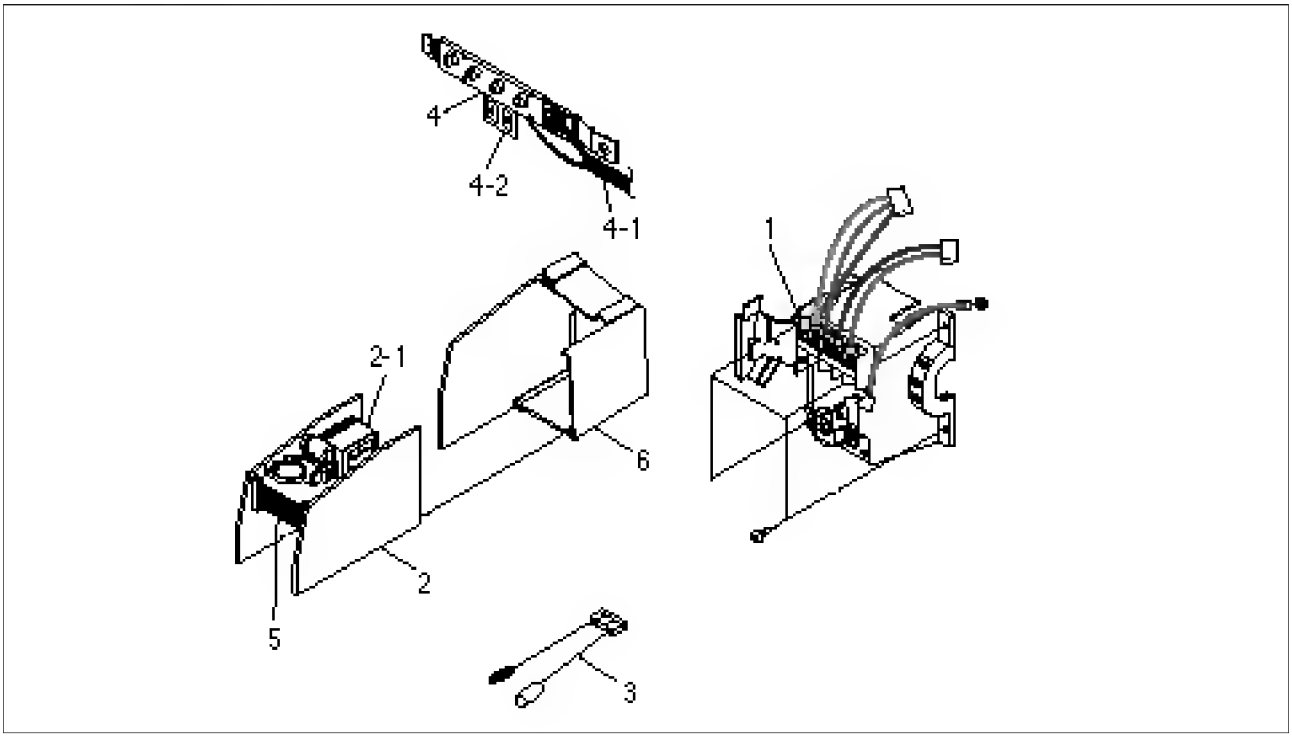
6-3-1 Remote Control



■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				18000BTU	24000BTU	
	DB93-30010D	Ass'y-remocon	ASH-1205ER	1	1	
1	DB61-10011A	Case-remocon(LOW)	ABS	1	1	
2	DB73-20025A	Rubber-button(B)	NBR	1	1	
3	DB09-10083A	IC-MCU	SMC621A	1	1	
	DB07-20034A	LCD	AT-025ZAR	1	1	
4	DB73-20009C	Rubber-button(A)	NBR	1	1	
5-1	DB61-10020A	Case remocon(UPP)	ABS	1	1	
5-2	DB64-20035A	Door-remocon	ABS	1	1	
5-3	DB64-40007B	Window-remocon	PC	1	1	
5-4	DB74-10008A	Filter-remocon	PC	1	1	
6	DB64-40068C	Inlay-remocon	ABS	1	1	
	DB61-40009A	Holder remocon	ABS	1	1	
7	DB63-10081A	Cover battery	ABS	1	1	

6-3-2 PCB Box



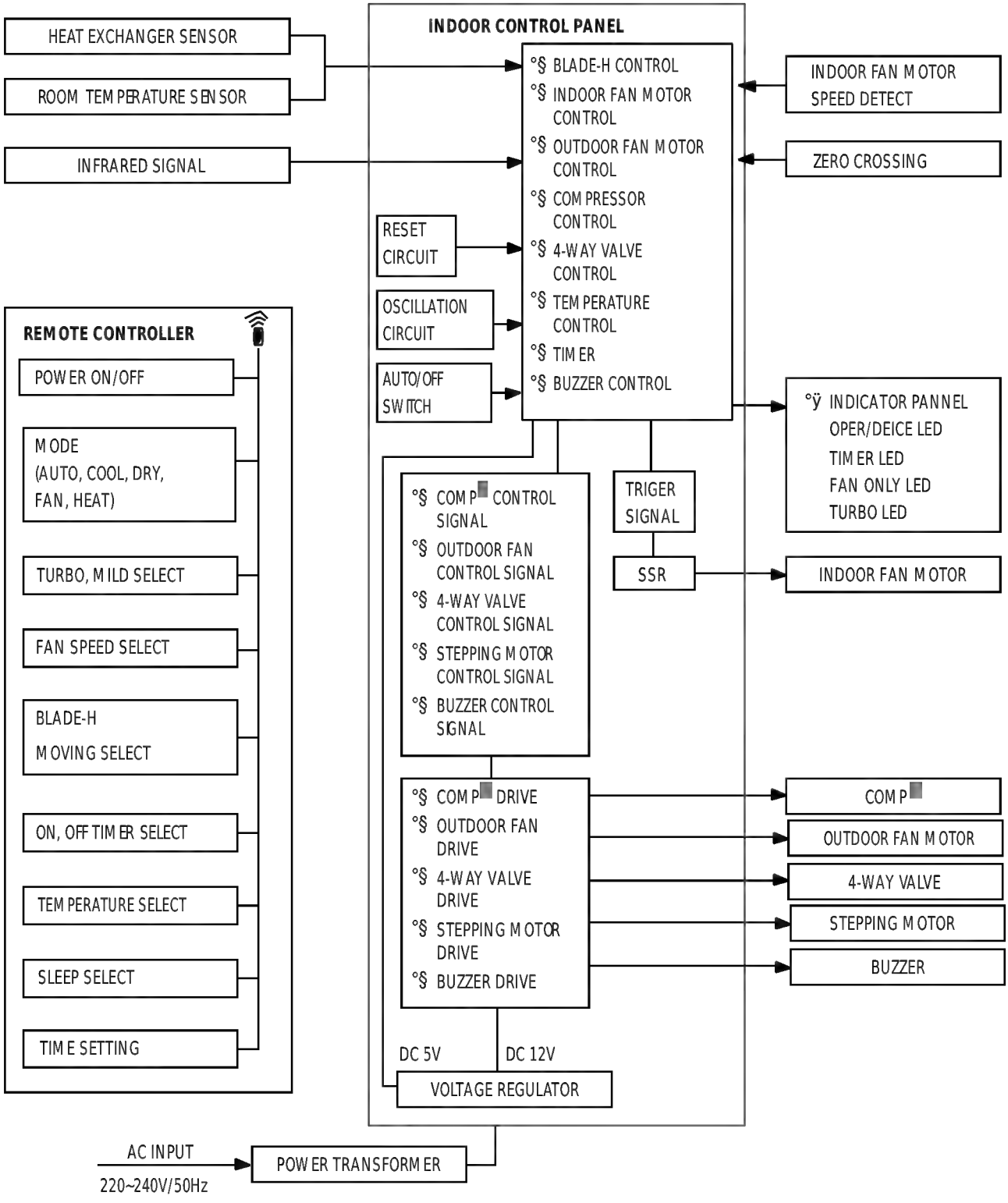
■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				18000BTU	24000BTU	
1	DB65-40058A	ASS'Y-TERMINAL BLOCK	ASS'Y 5P	1	1	
2	DB93-10442A	ASS'Y MAIN PCB	ASH-1808DR	1	-	
	DB93-10521A	ASS'Y MAIN PCB	ASH180UE	1	-	
	DB93-10435A	ASS'Y MAIN PCB	ASH-2417ER	-	1	
2-1	DE26-20114A	TRANS-POWER	AC230V DC17V	1	1	
3	DB32-10008B	THERMISTOR-ASS'Y	103AT	1	1	
4	DB93-10436A	ASS'Y-PCB SUB	ASH-2417ER	1	1	
4-1	DB39-20293A	C/W DISPLAY & MODULE	AWG26	1	1	
4-2	DB59-10012A	MODULE-REMOCON	GP1U271R	1	1	
5	DB39-20188B	CONNECTOR-WIRE POWER	AWM 1007	1	1	
6	DB61-10122A	CASE CONTROL	PP	1	1	

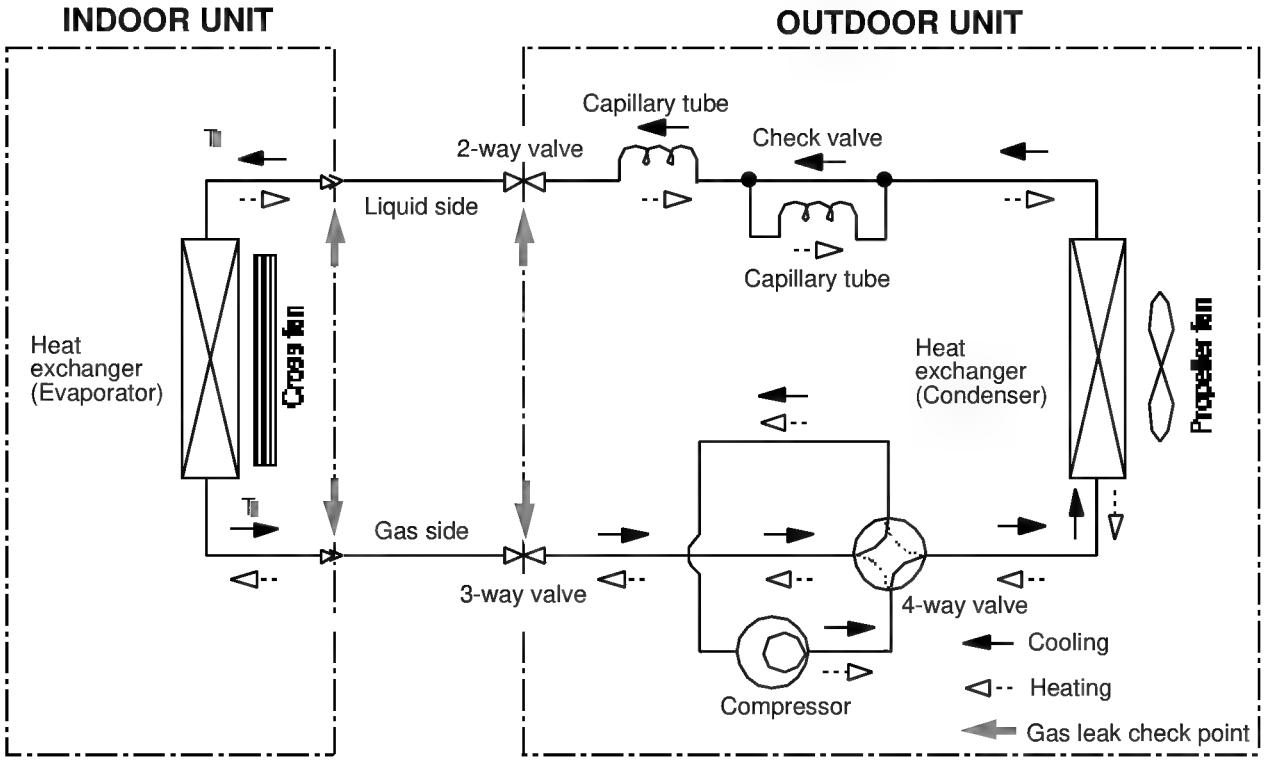
MEMO

7. Block Diagrams

7-1 Micro Computer Block Diagram



7-2 Refrigerating Cycle Block Diagram



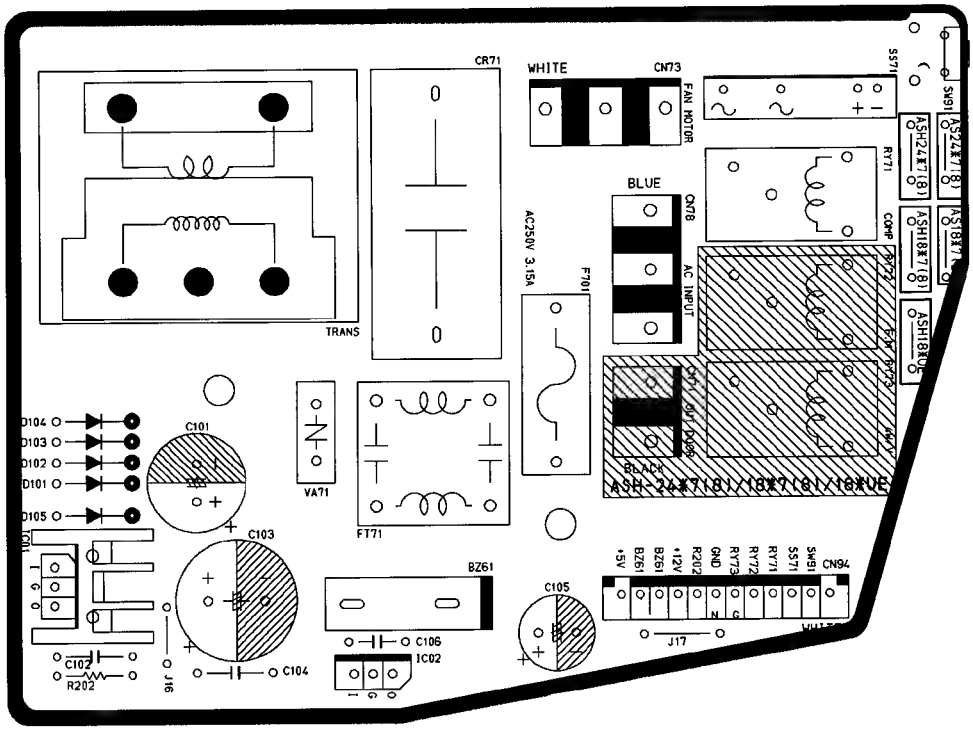
Refrigerating cycle temperature and pressure

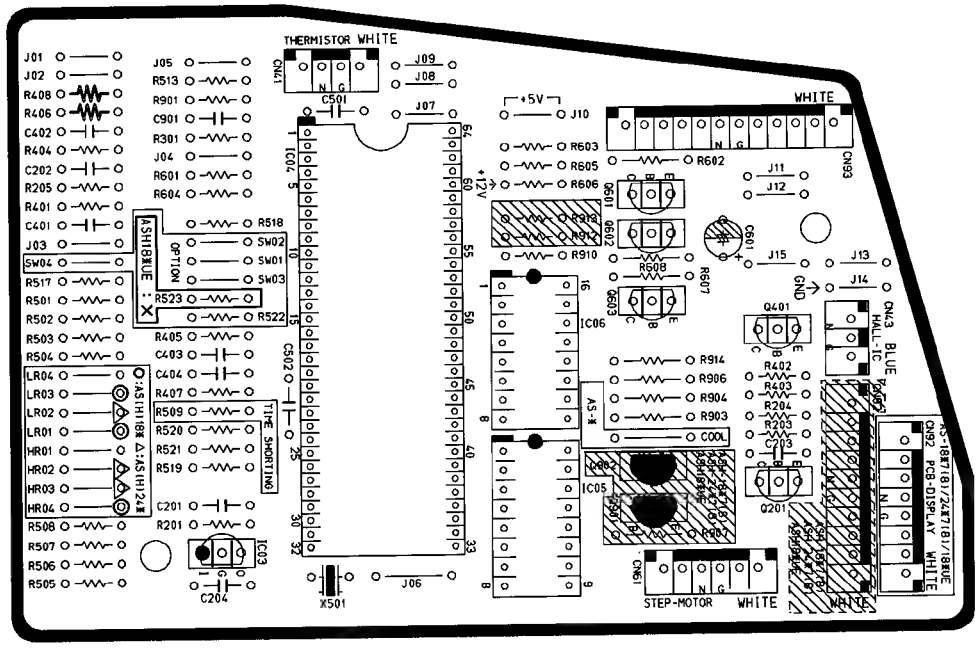
Operating Condition		STD Pressure (kg/cm2G) 3-WAY V/V	Piping Temp.		UseTemp. Condition (°C)			
			T1	T2	Indoor		Outdoor	
					DB	WB	DB	WB
Cooling	Standard	4.0~5.0	10~12	10~12	27	19(19.5)	35	24
	Max over load	-	16~18	14~18	29	19	54	24
	Low temp	-	1~4	1~4	21	16	21	16
Heating	Standard	19~23	32~36	60~70	20(21)	-	7	6
	Max over load	-	36~40	65~75	27	-	21	16
	Deice	-	28~32	40~45	20	-	2	1

MEMO

8. PCB Diagrams

8-1 Ass'y Main PCB (Code No : DB93-10521A) : ASH180UE/181UE
(Code No : DB93-10442A) : ASH-1808DR
(Code No : DB93-10435A) : ASH-2417ER

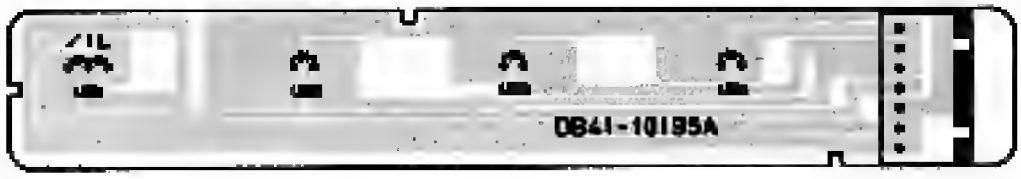


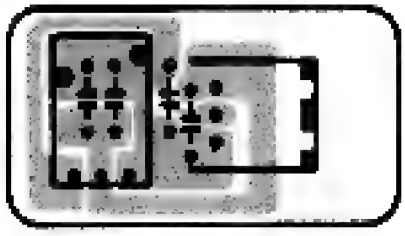


■ Parts List

No.	CODE NO	Description	Specification	Q'TY			Remark
				18000BTU	24000BTU	ASH180UE ASH181UE	
	DB93-10521A	ASS'Y MAIN PCB	ASH180UE	-	-	1	
	DB93-10422A	ASS'Y MAIN PCB	ASH-1808DR	1	-	-	
	DB93-10435A	ASS'Y MAIN PCB	ASH-2417ER	-	1	-	
J1~J17,LR01,LR03,HR04,SW02, SW03	DE39-60001A	WIRE-SO COPPER	PI 0.6 SN 52MM	23	-	23	
J1~J17,LR02,HR02,HR03,SW02,SW03	DE39-60001A	WIRE-SO COPPER	PI 0.6 SN 52MM	-	23	-	
D101~D105	0402-000559	DIODE-RECTIFIER	D4G 400V 1A	5	5	5	
C102,C104,C106,C201,C203,C204,C403,C404,C501,C502,C901	2202-000780	C-CERAMIC	UP050F104Z	11	11	11	
C202,C402	2202-000127	C-CERAMIC	TP050F103ZB	2	2	2	
C401	2202-000796	C-CERAMIC	UP050B102KB	1	1	1	
R405,R407	2001-000003	R-CARBON	RD 1/8 330-J	2	2	2	
R607	2001-000855	R-CARBON	RD 1/4 560-J	1	1	1	
R201,R204,R205,R401,R402,R404,R603,R605	2001-000429	R-CARBON	RD 1/8 1K-J	8	8	8	
R608	2001-000042	R-CARBON	RD 1/4 1K-J	1	1	1	
R203,R910,R912,R913	2001-000591	R-CARBON	RD 1/4 3.3K-J	4	4	4	
R403	2001-000890	R-CARBON	RD 1/8 6.8K-J	1	1	1	
R202,R301,R501~R509,R513,R517~R523,R601,R604,R606,R901	2001-000290	R-CARBON	RD 1/8 10K-J	23	23	21	
R903,R904,R906,R907,R914	2001-001192	R-CARBON(S)	RD 1/2 820-J	5	5	5	
R602	2001-001088	R-CARBON(S)	RD 1/2 1K-J	1	1	1	
R406,R408	2004-001137	R-METAL	RM 1/8 6.8K-F	2	2	2	
	DE60-60012A	PIN-EYELET	ID 2.1 OD 2.5	5	5	5	
	DE41-10358A	PCB-MAIN	FR-1 T1.6	1	1	1	
Q901,Q902	0504-000144	TR-DIGITAL	KSR2002 PNP	2	2	2	
Q201,Q401,Q601,Q602	0501-000398	TR-SMALL SIGNAL	KSC945-Y NPN	4	4	4	
Q603	0501-000292	TR-SMALL SIGNAL	KSA 708-Y PNP	1	1	1	
IC03	DE13-20009A	IC	KA 7533	1	1	1	
C601	A1104-0027	C-ELEC	CE04C 25V/47ßfi	1	1	1	
CN43	3711-000879	CONNECTOR-HEADER	SMW250-03 BLU	1	1	1	
CN41	3711-000940	CONNECTOR-HEADER	SMW250-04 WHT	1	1	1	
CN92	3711-000577	CONNECTOR-HEADER	SMW250-10 WHT	1	1	1	
CN71	A6010-1352	CONNECTOR-HEADER	YW396-03AV BLK	1	1	1	
CN61	3711-001038	CONNECTOR-HEADER	SMW250-06 WHT	1	1	1	
CN93,CN94	3711-001042	CONNECTOR-HEADER	SMW250-12 WHT	1	1	1	
CN73	3711-000262	CONNECTOR-HEADER	YW396-05AV WHT	1	1	1	
CN78	3711-000260	CONNECTOR-HEADER	YW396-05AV BLU	1	1	1	
VA71	1405-000147	VARISTOR	INR 14D 471K	1	1	1	
C101	2401-000180	C-AL	1000µF 35V	1	1	1	
C103	2401-000710	C-AL	2200µF 25V	1	1	1	
C105	2401-001397	C-AL	470µF 25V	1	1	1	
X501	2802-000103	RESONATOR CERAMIC	CST 10MTW 10MHZ	1	1	1	
SW91	3404-001013	SWITCH TACT	KPT-1115V	1	1	1	
IC05,IC06	DE13-20004A	IC-DRIVE,INVERT	ULN2003A	2	2	2	
CR71	2306-000294	C-FILM,MPPF	1.5ßfi 400VAC	1	1	1	
SS71	B4190-0016	THYRISTOR	SSR G3MB-202PL	1	1	1	
TRANS	DE26-20114A	TRANS-L,V	AC230V DC17V	1	1	1	
FT71	DE29-90004A	FILTER-NOISE	MD 250V~1.6A	1	1	1	
F701	DE32-10037A	FUSE	FST 250V 3.15A	1	1	1	
F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1	1	1	
RY71,RY72,RY73	3501-001042	RELAY-MINIATURE	UT205-12S	3	3	3	
IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1	1	1	
	DE62-30032A	HEAT SINK-S1	A6010 W15 L25.5	1	1	1	
	DE60-10100A	SCREW-TAPPING	PH 3 L6 FEFZY	1	1	1	
IC02	DE13-20016A	IC-VOLT REGU	KA7805A	1	1	1	
BZ61	DE30-20016A	BUZZER	CBE 2220BA	1	1	1	
IC04	DE09-30526A	IC-MCU	MB89635R-314	1	1	1	
R523	2001-000611	R-CARBON	RD 1/4 3.9K-J	-	-	1	

8-2 Display PCB (ASS'Y CODE NO:DB93-10436A)

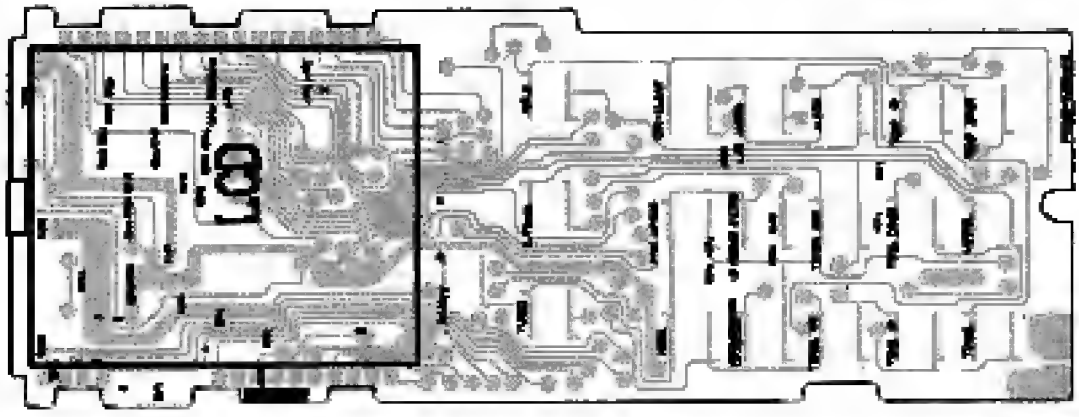




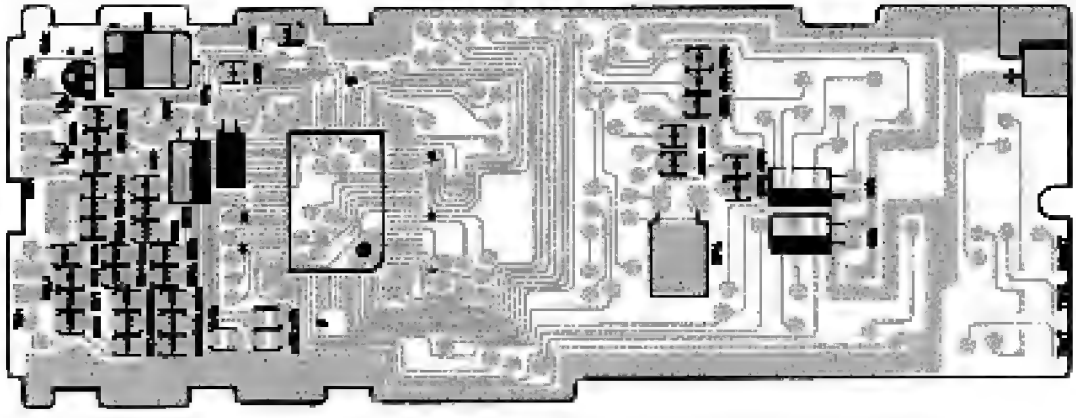
No	CODE NO	Description	Specification	Q'TY		Remark
				18000BTU	24000BTU	
LE01	0601-001096	LED LAMP	SAM5370	1	1	
LE02	B4150-0010	LED LAMP	LTL4254 YEL	1	1	
LE03	B4150-0009	LED LAMP	LTL4234 GRN	1	1	
LE04	B4150-0048	LED LAMP	LTL 4294 ORG	1	1	
MODULE	DB59-10012A	MODULE REMOCON	GP1U271R	1	1	
	3711-001075	CONNECTOR-WAFER	SMAW250-07(WHT)	1	1	
	3711-000869	CONNECTOR-WAFER	SMAW250-03(WHT)	1	1	
	DB39-20293A	C/W DISPLAY	AWG26/10, AWM 1007	1	1	
102Z	2202-000796	C-CERAMIC	CK-OA 50V 102Z	2	2	
104Z	2202-000780	C-CERAMIC	CK-OA 50V 104Z	2	2	
	DB41-10192A	PCB-MODULE	FR-1 AS-1267	1	1	
	DB41-10195A	PCB-DISPLAY	FR-1 ASH-2417ER	1	1	

8-3 Remote Control PCB (ASS'Y CODE NO:DB93-10171A)

● TOP SILK



● BOTTOM SILK

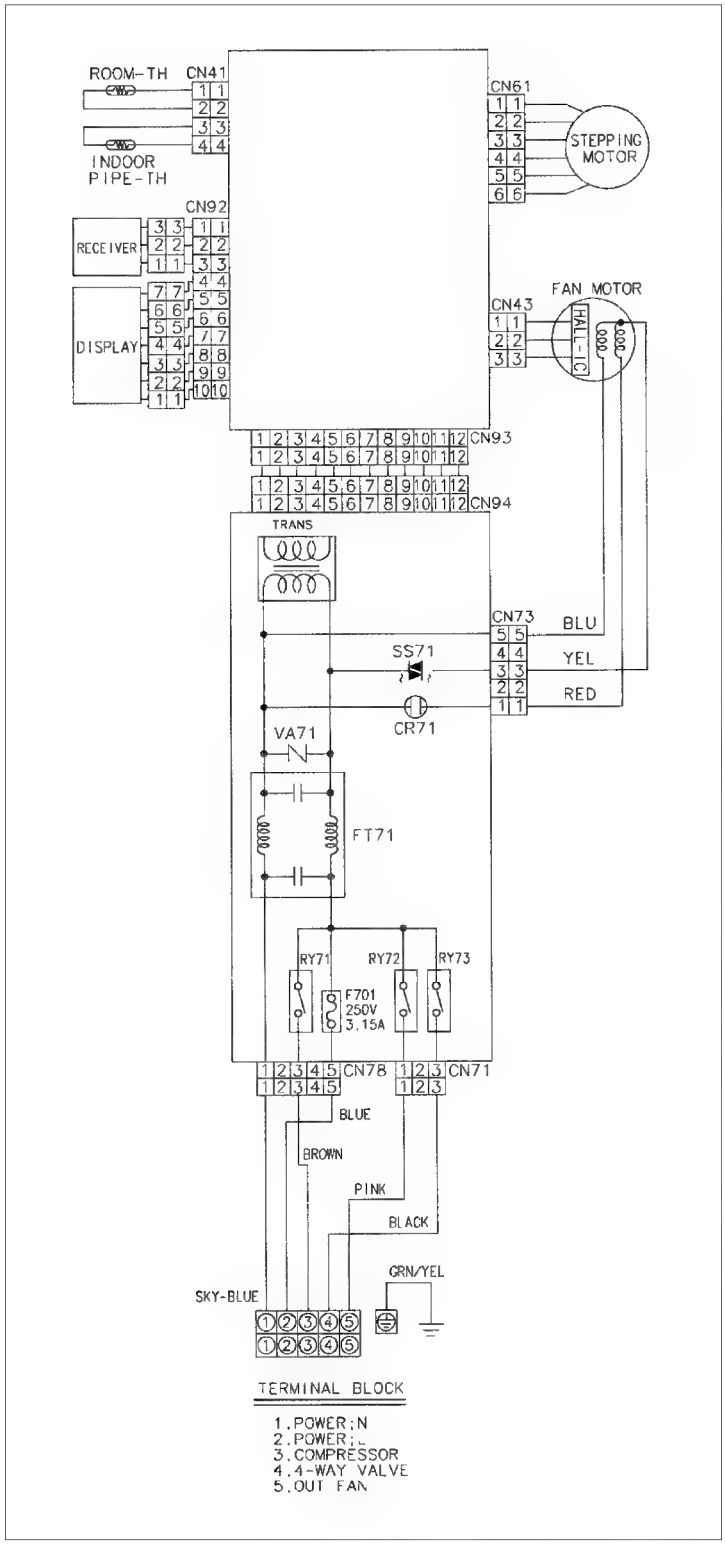


No	CODE NO	Description	Specification	Q'TY		Remark
				18000BTU	24000BTU	
R501-R507,R514		CHIP RESISTOR	MCR18EZH F 60.4K	8	8	
R515		CHIP RESISTOR	MCR18EZH F 120K	1	1	
R508-R513		CHIP RESISTOR	MCR18EZH F 30KF	6	6	
R601,R602		CHIP RESISTOR	MCR18EZH J 2.0	2	2	
R517		CHIP RESISTOR	MCR18EZH F 6.8K	1	1	
R603		CHIP RESISTOR	MCR18EZH J 68	1	1	
R604		CHIP RESISTOR	MCR18EZH J 1.2K	1	1	
R516		CHIP RESISTOR	MCR18EZH F 50K	1	1	
		CHIP RESISTOR	MCR18EZH J 5.6K	1	1	
C502-C506,C510		CHIP RESISTOR	MCH315A 104Z	6	6	
C511		CHIP CAPACITOR		1	1	
C512		CHIP CAPACITOR	MCH315A 103Z	1	1	
C101,C102		C-ELECTRONIC	SE 47 ßfi/6.3V	2	2	
C508,C509		CHIP CAPACITOR	MCH315A 101K	2	2	
C507		CHIP CAPACITOR	MCH315A 150K	1	1	
C501		C-ELECTRONIC	SE 1ßfi/50V	1	1	
TH01		ROOM THERMISTOR	103AT-2	1	1	
Q601		CHIP-TR	KSH-29,KSH-29C,C4375	1	1	
Q602		CHIP-TR	C1623-Y	1	1	
X502		CRYSTAL	455KHz	1	1	
X501		CRYSTAL	32.768KHz	1	1	
LE01		IR-LED	CL-1L5EU	1	1	
LE02		IR-LED	CL-1L5EU	1	1	
MICOM	DB09-10083A	MICOM	SMC621A	1	1	
LCD	DB07-20034A	LCD	AT-025ZAR	1	1	

MEMO

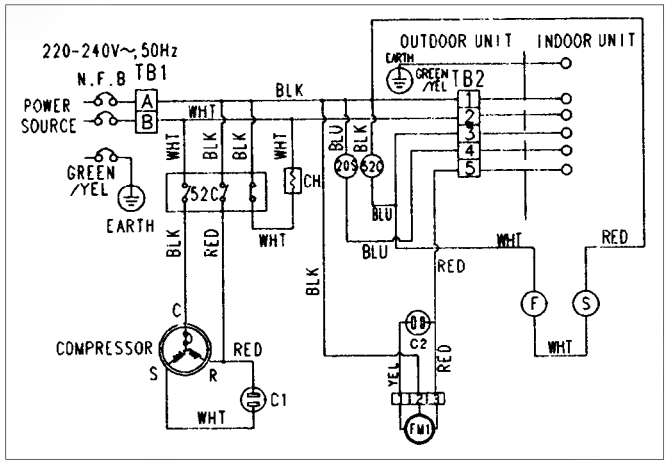
9. Wiring Diagrams

9-1 Indoor Unit



9-2 Outdoor Unit

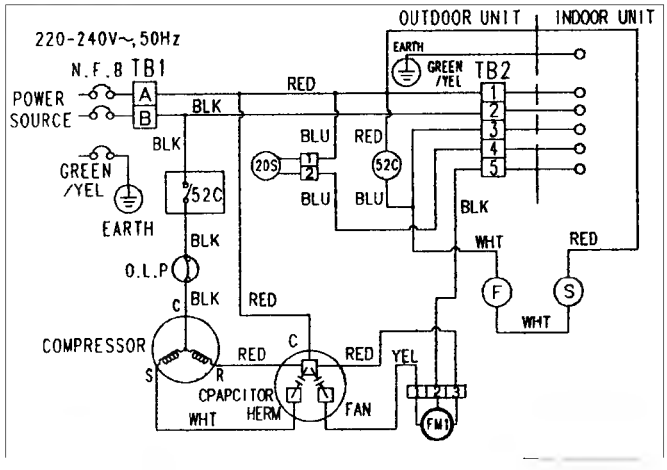
9-2-1 ASH-2417ER/1808DR



MARK	NAME	MARK	NAME
52C	MAGNETIC CONTACTOR	TB 1,2	TERMINAL BLOCK
20S	SOLENOID COIL	CH	CRANK CASE HEATER
C1, 2	CAPACITOR	FM 1	FAN MOTOR
F	FUSE(2A, 250V~)	S	SPARK KILLER

		ASH-2417ER	ASH-1808DR
CAPACITOR	FM 1	2.5uF × 450VAC	2.5uF × 450VAC
	COMP	45uF × 450VAC	40uF × 400VAC

9-2-2 ASH180UE/ASH181UE



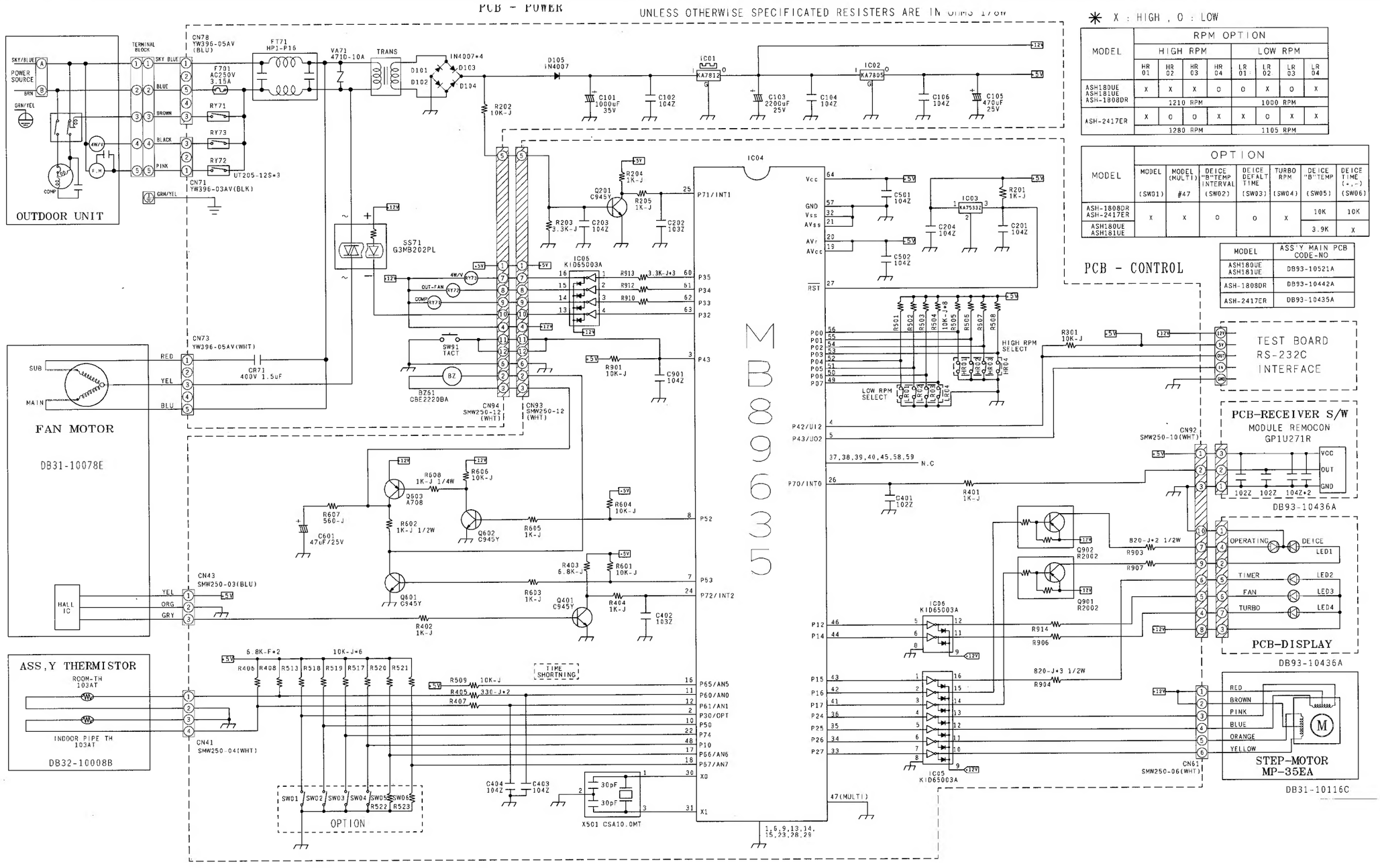
MARK	NAME	MARK	NAME
52C	MAGNETIC CONTACTOR	TB 1,2	TERMINAL BLOCK
20S	SOLENOID COIL	FM 1	FAN MOTOR
F	FUSE(2A, 250V~)	S	SPARK KILLER

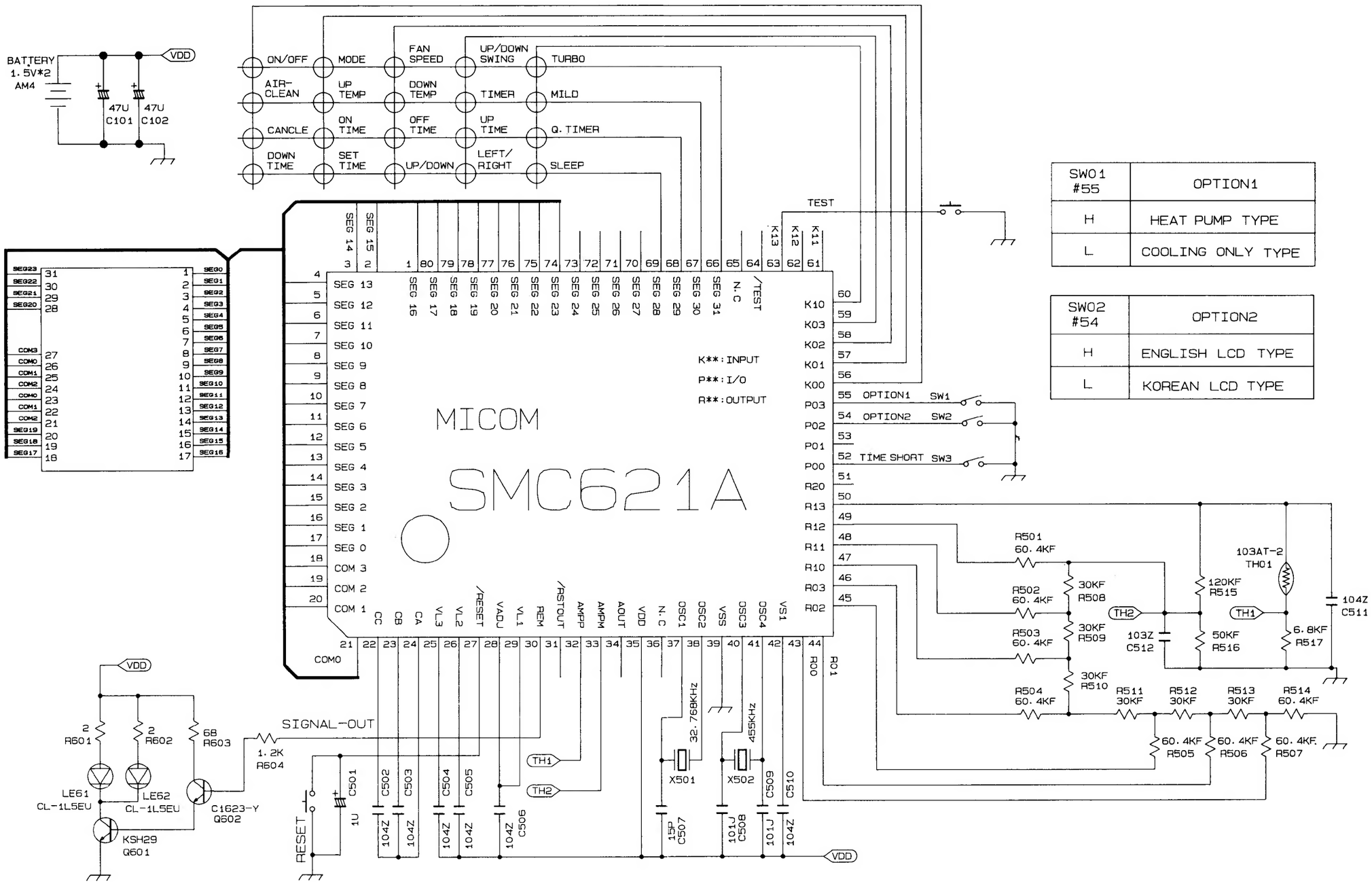
CAPACITOR	ASH180UE/ASH181UE : 2.5/40uF 450VAC

MEMO

10. Schematic Diagrams

10-1 Indoor Unit





SW01 #55	OPTION1
H	HEAT PUMP TYPE
L	COOLING ONLY TYPE

SW02 #54	OPTION2
H	ENGLISH LCD TYPE
L	KOREAN LCD TYPE

UPDA TE LOG SHEET

Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

Copyright

@ 1994 by Samsung Electronics Co., Ltd.
All rights reserved.
This manual may not, in whole or in part, be copied, photocopied, reproduced, translated, or converted to any electronic or machine readable from without prior written permission of Samsung Electronics Co., Ltd.
NoteMaster 486P Series Service manual First edition June 1994

Printed in Korea.

Trademarks

IBM is a registered trademark, and IBM PS/2, Personal System/2 MCA, Micro Channel, AT, XT, Monochrome Graphics Adapter (MDA) Color Graphics. Adapter (CGA), enhanced Graphics Adapter (EGA) and Video Graphics Array (VGA) are trademarks of International Business Machines Corporation.
MS-DOS is a registered trademark, and Windows, SMARTDrive and Microsoft and trademarks of Microsoft Corporation.
Intel, 80486SX, 80486DX4 are trademarks of Intel Corporation.
Samsung is a registered trademark, and NoteMaster, NoteMaster 486P are trademarks of Samsung Electronics CO., Ltd.